JANUARY 22, 1996 VOLUME 13, NUMBER 4

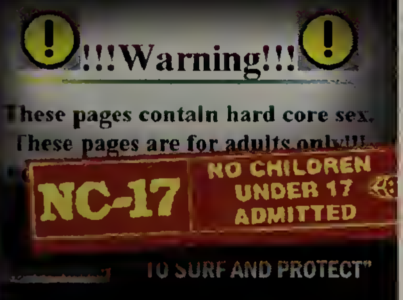
# NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

COMNET PREVIEW

Our ComNet guide will heat up your trip to Washington, D.C. **Page 54.**

Special report


!!!Warning!!!

These pages contain hard core sex.
These pages are for adults only!!!

NC-17 NO CHILDREN UNDER 17 ADMITTED

TO SURF AND PROTECT"

# Too sexy for my Web

**By Ellen Messmer**

At some corporations, surfing the 'Net for sex sites is a dirty little secret.

But not at Texaco, Inc. Employees there who are caught cruising inappropriate Internet districts are likely to see their names in a corporate memo, along with details of their transgressions.

"Our approach is to let everyone know about it," said Alan Raymond, manager of Texaco's computer security group.

*See* Sex, *page 8*

# IBM lures customers to switch-centric nets

**By Michael Cooney**
*Raleigh, N.C.*

IBM is developing an array of low-speed ATM products and legacy migration tools designed to help customers begin the move to switch-centric networks.

Company executives in a briefing here last week outlined a variety of products that will emerge in 1996, including a suite of low-end LAN hubs and switches designed to ease the task of building Asynchronous Transfer Mode-based workgroups.

They also explained how Multiprotocol Switched Services (MSS) technology will be used with High Performance Routing (HPR) to migrate legacy SNA/Advanced Peer-to-Peer Networking users to ATM. Combining the technologies will enable customers to run APPN traffic over ATM nets, and provide improved congestion control and traffic management capabilities between ATM switching components.

Analysts said the announcements show how serious IBM is about ATM and highlight how critical it is for

*See* IBM, *page 65*

DAVE KELLERMAN

**IBM's** *Rob Zimmer, says SNA/APPN customers can skip routing, move right to switching.*

ON-LINE

There's plenty more on Network World Fusion (http://www.nwfusion.com), including:

- A copy of the latest HPR specs
- Articles on Nways switches
- A look at Cisco's SNA plans

Select News+ then Front Page.

Network Fusion

# HP hedges on high-speed LANs

*100VG-AnyLAN leader caves in and plans to roll out ambitious 100Base-T line.*

**By Jodi Cohen**
*Roseville, Calif.*

For nearly three years, Hewlett-Packard Co. pitched 100VG-AnyLAN as the end-all for speedy LAN connectivity. Now, it seems, the company is not so sure.

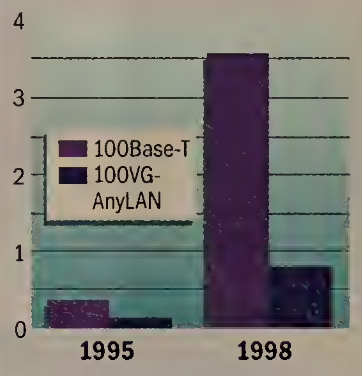
In fact, HP will soon abandon its VG-only strategy and add archrival 100Base-T interfaces to its product mix. Although the company will continue to expand its 100VG-AnyLAN product line, analysts said HP's move may lead some developers to bail out and stifle the technology's chance for success.

HP will roll out 100Base-T uplink modules for its LAN switching gear in a product blitz designed to bolster its standing in the mid-tier LAN hardware market. Other products expected include switches, remote access devices, infrared LAN extensions, mobile computing gear and network management products, according to

*See* HP, *page 66*

**THE FAST LAN RACE**

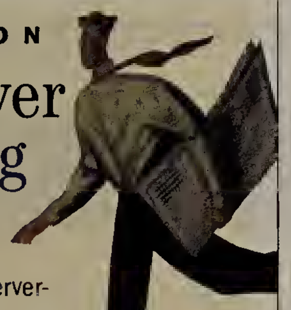
**Projected hub port shipments** (in millions)



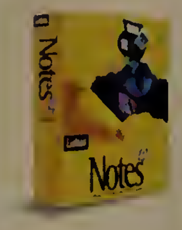
100VG-AnyLAN is HP's fast LAN technology of choice, but the company will soon offer its customers the more popular 100Base-T alternative.

SPECIAL SECTION

# Moving to Client/Server Messaging



With heavyweights Lotus and Microsoft bounding into the ring, it's time to get a grip on client/server-based messaging. Here's what all the hubbub is about and some advice from experts on how to make the right choice. **Page 44.**



Their tests complete, our own experts say Notes 4 will be a strong competitor. Performance and scalability have been bumped up, Internet access is built in, and there's a smooth migration path from Release 3. **Page 51.**

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**Access Network World Fusion using the number in yellow. See page 5 for details.**

# Novell loses top techie

**By Kevin Fogarty**
*San Jose, Calif.*

Novell, Inc. has lost its chief evangelist.

Sheldon Laube joined Novell six months ago as chief technology officer to rationalize the firm's product line, make it more responsive to customer needs and convert the world to Novell's new vision of a Smart Global Network. Now he's calling it quits, saying he has been lured to a Web start-up founded by two other Novell refugees.

Laube's unexpected departure, coming as it does after a string of reorganizations and executive resignations at Novell, raises questions about the company's ability to hang on to high-level talent. And what about Novell's ability and desire to carry through on Laube's vision?

Novell president and Chief Executive Officer Robert Frankenberg recruited Laube from consulting firm Price Waterhouse, where he spearheaded a massive move to Lotus Notes and made the questionable decision to standardize on Borland International, Inc.'s Quattro Pro spreadsheet. At the time of his hiring, Laube said his job was to bring a customer's perspective to Novell.

Since last September, when Novell began a series of sell-offs and reorgani-

*See* Novell, *page 66*

**Sheldon Laube described his departure from Novell to U.S. Web as "the chance of a lifetime," the same phrase he used last summer to describe his job as Novell's chief technology officer.**

Start-up

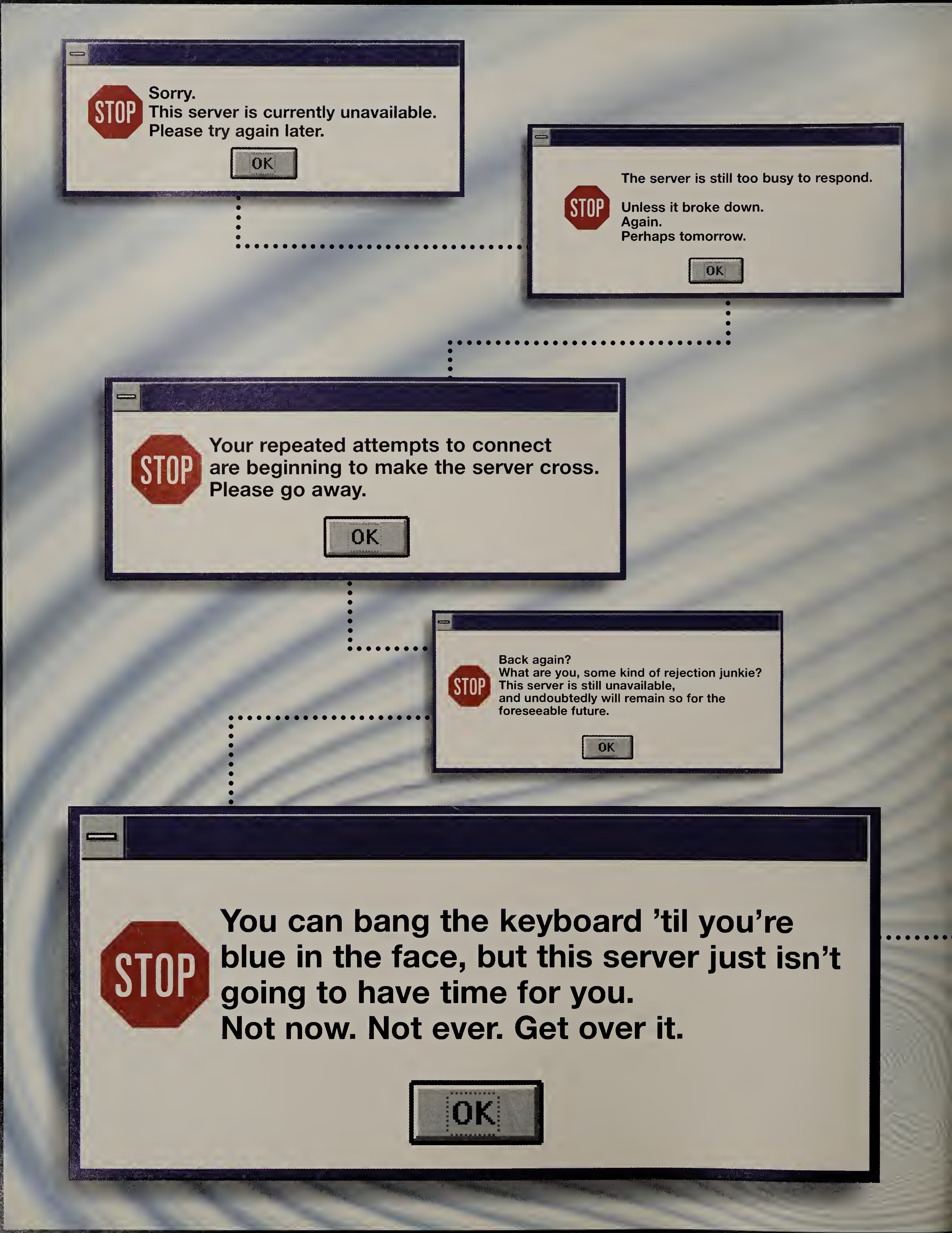
# Multimedia traffic without the ATM fuss

**By Barb Cole**
*Cupertino, Calif.*

The husband and wife team that launched Bridge Communications and Network Computing Devices, Inc. has a new challenge — enabling companies to support multimedia traffic without making an expensive upgrade to ATM.

Judy Estrin and Bill Carrico this week will introduce their latest brainchild, Precept Soft-

*See* Multimedia, *page 65*



Sorry.
This server is currently unavailable.
Please try again later.

The server is still too busy to respond.

Unless it broke down.
Again.
Perhaps tomorrow.

Your repeated attempts to connect
are beginning to make the server cross.
Please go away.

Back again?
What are you, some kind of rejection junkie?
This server is still unavailable,
and undoubtedly will remain so for the
foreseeable future.

**You can bang the keyboard ’til you’re
blue in the face, but this server just isn’t
going to have time for you.
Not now. Not ever. Get over it.**

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### This Week

**News+**

**The Front Page:**

- Censor this: Pore over Virginia bills that seek to ban government workers from gawking at sexually explicit Web sites.
- Load up on white papers about migrating to 100VG-AnyLAN and 100Base-T.
- View documents about the Real-Time Transport Protocol, MBONE and other ways to move multimedia across the Internet.

**The Technical Sections:**

- Going Web cruising? Find out when the Web rush hour is and plan your travel accordingly, in WANs & Internetworking.
- Pick up white papers from vendors pushing 25M bit/sec ATM to the desktop – and read why users still have doubts about the technology – in Local Networks.

**NetRef**

- Does the introduction of Notes 4.0 herald a new generation of client/server messaging applications? Turn to NetRef for a complete package of news, reviews, opinions and links about the newest Notes, messaging, replication and more.

**Other areas:**

- **Professional Development:** New seminars.
- **DirectConnect:** Download demo software.
- **Network World Central:** Get in touch with us.

### this week's pick

If you need 32-bit Internet applications for all your Windows 95 users, then look no further than Stroud's Windows 95 Apps Page at http://cwsapps.texas.net/win95.html. Not only does it have links to scores of Win95 Internet shareware, freeware and demo applications, but it also boasts reviews and ratings for each one.

**HOW TO GET ON TO NETWORK WORLD FUSION**

At the welcome screen, click on Registration and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Non-subscribers must fill out an on-line registration form.

NetworkWorld Fusion

### CONFERENCE PICK

**HOT TOPIC**

**Have you implemented voice over ATM? What were your biggest stumbling blocks?**

**From the main menu, select Forum, nwfusion.talk then Topic 20.**

NetworkWorld
An IDG Publication

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COMNET PREVIEW

**SPECIAL SECTION**

### Moving to client/server messaging

*As products trickle out, it's time to assess whether to take the leap.* **Page 44.**

NetworkWorld TEST ALLIANCE

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**NetworkWorld's** *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

## News briefs, January 22, 1996

### Cybermergers

■ It was merger week in cyberspace, a sign that the Internet products market is maturing. Microsoft Corp., scrambling to stake out a strong Internet presence, spent an estimated $130 million to buy Vermeer Technologies, Inc., a Cambridge, Mass., Web development tool maker. Separately, TCP/IP stack vendor FTP Software, Inc. said it will acquire Firefox Communications, Inc., another TCP/IP software vendor, in a stock deal worth between $80 million and $100 million.

### Cisco goes remote

■ Cisco Systems, Inc. will use next week's ComNet '96 show to roll out five remote access products. They include CiscoRemote+ 2.0 and CiscoRemote Lite 2.0 software packages, which both now include ISDN LAN drivers and Windows 95 support. CiscoRemote+ 2.0 also now supports Version 2.0 of Netscape Communications Corp.'s Navigator Web browser and Version 3.0 of DataBeam, Inc.'s FarSight conferencing software. Cisco will also unveil three additions to the Cisco 200 series of remote node ISDN products. Cisco officials declined to comment on the products.

### Fast times at Cabletron

■ Cabletron Systems, Inc., of Rochester, N.H., this week will unveil its fast Ethernet road map, which will address workgroup as well as backbone environments. On the low end, Cabletron will roll out its FastNet family of products, including hubs and switches acquired last year from Standard Microsystems, Inc. In addition, Cabletron will resell Intel Corp.'s 10M/100M bit/sec adapter card under the FastNet name. For the backbone, Cabletron will announce internally developed SmartSwitch fast Ethernet modules for the Multi Media Access Center (MMAC) and MMAC-Plus switching hubs.

### High-speed Notes access

■ CompuServe, Inc. this week will announce at Lotusphere frame relay access to its Notes public network service, dubbed Enterprise Connect. The service, previously accessible only over dial-up lines at up to 28.8K bit/sec, will now be accessible at speeds from 56K to 1.5M bit/sec. A 56K bit/sec link costs $1,130 per month, including the price of the server.

CompuServe also will announce its Enterprise Mail service, which will enable companies with private Notes networks to send E-mail in Notes format to CompuServe. CompuServe will then forward it for distribution on the Internet at 2 cents per 5,000 characters.

### ODS switch pitch

■ Optical Data Systems, Inc. of Richardson, Texas, will roll out the Warrior Switch Module line for its Infinity hub at this month's ComNet '96 trade show in Washington, D.C. The gear will include Ethernet, token-ring, FDDI and Asynchronous Transfer Mode switching modules. The modules can be managed via any Simple Network Management Protocol-compliant platform and support Remote Monitoring capabilities. Pricing and availability have not yet been set.

### Documenting the Web

■ Interleaf, Inc. and Documentum, Inc. this week are separately announcing interfaces that will let end users equipped with Web browsers tap into the vendors' document management products. Interleaf's Intellecte/BusinessWeb is designed as an open interface that will eventually work with third-party document products. Available in April, it will cost $25,000 for an application template and Interleaf's Liason API. Documentum's Accelera interface will be available in March at $20,000 per server.

### JavaSoft is born

■ The Java Internet programming technology, developed at Sun Microsystems, Inc., now has its own division: JavaSoft. Alan Baratz, former head of Delphi Internet Services Corp., will step in as the new JavaSoft president. His job will be to turn Java into a money-making vehicle for the parent company, according to industry observers.

# Informix readies multimedia, Web splash

*Company to combine its core database with technology from recently acquired Illustra.*

**By Barb Cole**
*Menlo Park, Calif.*

Informix Software, Inc. will extend its mainstream database to handle multimedia data and content from the World-Wide Web.

On Feb. 6, Informix will announce the Informix-Universal Server, which combines its existing database with technology it acquired last month from Illustra Information Technologies, Inc.

Informix declined to provide specifics but said a software kit to let Informix applications handl nontraditional data is due b year-end. Further integration o the two servers will likely com sometime after that, source said.

At the core of the plan is server-based DataBlade API to b developed by Informix, which will let developers store video images, text and other data type within Universal Server. The AP will interface with Illustra's Data Blade software modules, which currently reside outside the cor Illustra database server and ar used for accessing data types no supported in Informix's server.

The integration also is expected to extend the paralle processing capabilities of th Informix server to the sometimes sluggish complex dat types.

Analysts said that if the company can successfully integrat its database with Illustra's server it has a chance to gain ground o rival Oracle Corp., which currently sells about twice as much client/server database softwar as Informix.

"Without Illustra's technology, Informix was probabl behind Oracle [in developin support for nontraditional dat types]," said Curt Monash, editor of the "Monash Software Letter." "Now Informix has th early lead."

The ability to support text video and images is seen as key t managing the diverse content of the Web. Oracle has promised to deliver such support but ha been stingy on details. Mean

*See* **Informix,** *page 65*

**Dealing with a universe of data**

**Through integration with Illustra DataBlade software modules, Informix-Universal Server will support the following data types:**

- Text
- 2-D spatial
- 3-D spatial
- Time series
- Statistics
- Image
- Video
- Web
- Sybase and Oracle data

# Sybase shifts its focus back to data and away from objects

**By Barb Cole**
*Emeryville, Calif.*

Sybase, Inc. has halted a project that was to be a key part of the object strategy for its flagship database.

Late last year, the database maker moved a team of developers off the effort, code-named Brahms, that may have resulted in an add-on to support objects in its relational database. Sources said Brahms was aimed at storage and retrieval of data types such as text, video and images.

The bulk of Brahms developers were put to work on SQL Server 11, the long-awaited database release that recently shipped, according to Craig Woods, director of product marketing at Sybase.

Woods declined to comment on how many developers were working on Brahms, but he said it was a "significant effort." He added that Brahms was one of many object-related research projects at the company and that Sybase still is committed to incorporating objects into its technology.

The company's overall object strategy, however, has lagged. At one point, Sybase targeted object support for SQL Server 11 but then said it would come sometime in 1997 in the form of a database add-on.

"In terms of object support, Sybase has had some false starts and has some serious catching up to do," according to Curt Monash, editor of the "Monash Software Letter."

Woods declined to comment on any current plans to add object support to SQL Server.

Last year, the company outlined a four-tier approach to object support that included OLE and C++ support in the PowerBuilder application tool; a Sybase object request broker; object extensions to its middleware offerings to support object data types; and the storage of objects in its database.

The company declined to give specifics on the status of the four-tier plan, but sources said the tools and middleware portion are on schedule. "We've announced some of the [object] technology relating to PowerBuilder, and we'll make some announcements about our middleware later this year," Woods said. ■

NetworkWorld Fusion

**There's more available on Network World Fusion (http://www.nwfusion.com), including:**

- **A paper on the coexistence of relational DBMS and distributed object networks**
- **A paper that compares relational and object-oriented databases**
- **A look at NeXT Computer's WebObjects project**

From the main menu, select News+ then Client/Server Applications.

## HOW TO REACH US

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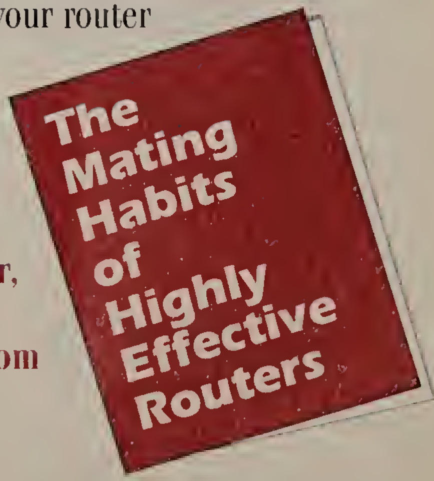

Cray Communications

# Sex

*Continued from page 1*

Management at Texaco forbids employees to use corporate resources to surf Web sites and newsgroups with sexual themes. The company monitors Internet traffic through reviews of network logs to ensure the policy is obeyed.

After catching someone breaking the "No sex on the 'Net" rules, the company issues a general memo detailing the employee's misbehavior. According to Raymond, this has proven to be the only effective means to bring the wayward back into the fold.

### Just say no?

Texaco is hardly alone trying to rein in employees who squander corporate time and resources by surfing for sex. Kmart Corp. fired its Webmaster for linking the corporate site to a personal one, which included erotica.

The thought that employees are dallying in Internet sexcapades is a worry for corporate management everywhere. They're fretting about employee productivity, and they're deeply concerned that an employee's cybersex indulgences could lead to the corporation itself facing a sexual-harassment lawsuit in the workplace.

"Every company we've worked with to develop a technology policy says they don't want individuals downloading or distributing pornographic materials," said Barry Weiss, attorney at Chicago law firm Gordon & Glickson pc.

Erotica that is downloaded could prompt sexual-harassment lawsuits from employees offended by lurid materials, Weiss pointed out.

"It's a question of legal liability and what creates a hostile working environment," Weiss said.

Companies may be reluctant to grab hold of such a hot potato, but they would do well to confront the sex issue squarely by defining an Internet acceptable-use policy, Weiss said. And they should make sure all employees know about it.

However, there are legal fine points companies have to keep in mind. First off, monitoring employee network use remains a controversial issue.

The Electronic Communications Privacy Act of 1986 (ECPA), while aging rapidly, still remains one of the most used yardsticks to determine what's legally permissible.

The law, which seeks to define privacy rights for communications supplied by both public and private services, touches on the question of how far employers can go to monitor and read employee communications.

While the ECPA seems subject to endless interpretation, Weiss said it clearly suggests that employees should be notified when they are being monitored electronically. But even that may not be enough to pass legal muster.

"There's the question of whether consent is required," Weiss said. "So in rolling out Internet access, I suggest getting employee sign-off that the company reserves the right to monitor communication."

But civil liberties arguments from employees over the right to access sexually explicit materials probably won't hold much weight in a legal battle, Weiss said.

"It costs companies money to make Internet access available," Weiss said. "It's hard for an employee to defend this as a legitimate business interest." No one in their right mind would argue that they have the right to call 900-number phone sex services on company time, and the same analogy would seem to hold about surfing the 'Net for sex, Weiss concluded.

### Kmart's Internet sex policy

Kmart says it does not routinely monitor employee Internet activities. But late last year, the company had to confront the Internet sex-site issue when it discovered Kmart Webmaster Rob Fournier had hyperlinked the corporate Web site to his own personal Web pages, which contained erotica.

Fournier's personal Web pages also contained hyperlinks to other Web sites deemed offensive, said Kmart spokesman Dennis Wigent. Kmart summarily fired Fournier for violating the company's written Internet code of behavior.

**Employees** *may be tempted to tap into the wealth of sexually explicit material available on the 'Net.*

Kmart's Internet code, established in September, explicitly forbids employees from sending or receiving sexually-oriented messages or images over the Internet (see graphic).

"We developed this policy before we had a problem," Wigent said.

Kmart employees know violations of the policy can result in dismissal, and Kmart deemed Fournier's infraction to be grave enough to warrant termination, he added.

The whole Internet sex controversy, along with worries about security, is causing some corporations to rethink plans to give employees broad Internet access.

"Management here has pulled back on Internet access in large part due to concerns like these," said John Gregor, information systems consultant at Frigidaire Corp. The company had planned to roll out Internet access to hundreds of employees, but that is now being reviewed.

### Internet sex on campus

Universities have joined the debate over whether organizations should censor Internet access.

"It's a controversial issue here," said Joe Hagan, data communications coordinator at Southern Indiana University. Professors, students, school officials and network professionals have argued over the level of Internet access available to everyone through the university's computer labs.

"We were divided down the middle," Hagan said. After fierce debate, the school's Computer Advisory Committee decided not to block access to any sites.

"Some of us wanted to have some of the most risque sites blocked to the students since there's no educational value," Hagan said. "But arguments for academic freedom, and freedom of speech, overrode this." ■

## A SAMPLING OF KMART'S INTERNET USE POLICY

**Kmart Internet users WILL:**

- Remember that E-mail sent from Kmart travels on Kmart's electronic stationery and, as such, is the same as if it were sent on Kmart letterhead.
- Assume that all E-mail can and will be read by systems administrators.
- Take all required precautions against importation of computer viruses.
- Use common sense at all times.

**Kmart Internet users WILL NOT:**

- Take actions that cause interference to the network or the work of others.
- Post items on the Internet that do not reflect the policies of Kmart.
- Operate a business through the Kmart Internet link.
- Send mail or other communications, files or programs containing offensive or harassing statements, including comments based on race, national origin, sex, sexual orientation, age, disability, religion or political beliefs.
- Send or receive sexually oriented messages or images.

## TAKING THE LONG WAY

**Some Texaco employees with strong libidos and network smarts have tried to fool the company's tracking system. These sex surfers first log on to a university site and then search for naughty sites. However, the Texaco worker assigned to review the network logs — a woman vehemently opposed to pornography — usually catches on to such evasive actions.**

## The tech fix

Recognizing that organizations may want to control and monitor Internet use, a wide range of technology vendors are leaping at the opportunity.

The latest version of Performance Technology, Inc.'s LAN access product can block access to specific sites and monitor employee Internet activity.

And last week, White Plains, N.Y., start-up System Management Arts, Inc. announced Unix-based software called InCharge for the Internet. The software, priced at $6,500, lets systems administrators shut off access to specific Internet hosts and keep a log of employee activity.

InCharge for the Internet software runs on a Sun Solaris workstation positioned either inside or outside the corporate firewall to the Internet.

"You can invoke your policies for access control for Domain Name Service, File Transfer Protocol, Web sites mail and newsgroups," said Shaula Yemini, president of System Mangement Arts.

Some existing tools, such as Sun Microsystem, Inc.'s Netra server, already offer some access controls.

Some firewalls, such as those from Sterling Software, Inc., include monitoring tools.

*—Ellen Messmer*

## Internet sex: Against the law?

In Congress and state legislatures, the notion that sex on the Internet can be stamped out by new laws has gained momentum.

Congress has yet to pass the long-awaited telecommunications reform bill, which supports two-year jail terms and fines of up to $100,000 for distributing indecent materials on-line.

If approved, corporations will be forced to worry even more about sex on the Internet, noted Barry Weiss, attorney at Chicago law firm Gordon & Glickson pc.

Sex on the Internet is also on the minds of some state legislators. Just this month, Virginia state Delegate Robert Marshall introduced legislation, which, if passed, would prohibit government workers from using government computers to visit pornographic sites, with offenders subject to reprimand or dismissal.

"These images can lead to an obsession," Marshall said, adding that anyone who wanted to access the Internet for sexually explicit material should do so on their own computer. Another bill introduced by Marshall would require schools to filter sexually explicit material from Internet services they make available to students.

The Virginia chapter of the American Civil Liberties Union has expressed dismay over the bills, calling them an attempt to regulate free speech.

*—Ellen Messmer*

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*In-Site*

# When it comes to the Web, FedEx can deliver

**By Ellen Messmer**

*Memphis, Tenn.*

Just over a year ago, Federal Express Corp. amazed the network world by boldly connecting its package-tracking mainframe to the Internet so customers could log on to check delivery status via the Web.

This move, which earned FedEx recognition as perhaps the first truly interactive business Web site, was later imitated by United Parcel Service of America, Inc., which last summer offered its own Web-based shipment-tracking system.

"We can't get requests for shipments via the Web today, but that will change," said Michael Janes, FedEx vice president of electronic commerce and logistics marketing. "We believe the Internet is the place to be."

FedEx is close to achieving yet another milestone: becoming the first company to accept package pickup requests via its Website.

Accepting package delivery requests from customers over the Web requires tighter security measures than parcel tracking, where a customer with a Web browser can anonymously input a FedEx parcel number.

For Web-based package pickup and changes, however, FedEx must be able to authenticate the customer's identity to snuff out fraudulent requests.

"There is no easy answer to Web security problems," said Susan Martin, FedEx manager of Internet technology. But the company has been looking closely at how public-key encryption certificates in the Netscape Communications Corp. Navigator 2.0 browser used with the Netscape Commerce Server could authenticate customer identity and keep data confidential.

**FedEx's** *MIS team (above) and Michael Janes are charting the company's Internet course.*

PHILIP PARKER

## Long technology history

FedEx views communications on the Web as a vital part of its long-standing effort to communicate via computers with customers and wean them from a dependence on the phone or handwritten airwaybills.

FedEx already handles 60% of its daily volume — about 2.5 million packages — through use of electronic forms, said Robert Hamilton, FedEx manager of information services. Customers send in E-forms over dedicated lines to FedEx.

In the early 1980s, FedEx started giving its biggest customers specially built terminals and software they could use to dial in to the FedEx global network to place package delivery orders.

Offered under the name PowerShip, these terminals, bar-code readers and eventually PC desktop software made it possible for many FedEx customers to dial in via a dedicated line.

"We now have 200,000 customers on-line, representing 60% of our volume. But at the same time, there is a recognition at FedEx that our goal should be 100% of our volume on-line," Janes said. "Electronic commerce is no longer a separate part of FedEx, but an integral part, focused on the desktop."

The overnight shipping giant would like to see all of its four million customers online and believes the way to reach them — especially the smaller businesses — could be the Web.

"All along the way, we've been getting contact on-line with ever-smaller companies," said Robert Hamilton, FedEx manager of information services marketing. "And they don't need a dedicated machine or a dedicated line. The Web evolved faster than we thought, and the question now is, how do we build the next tier?"

## The Web effort

In 1994, the FedEx marketing division found out, by chance, that the networking division, headed by Manager Miley Ainsworth, had already set up a FedEx Web site.

Without a pause, FedEx managers linked an internal client/server tracking database to the Web server so that any customer with a standard HTML browser could check the status of a FedEx package.

By the end of 1995, more than 25,000 customers were visiting the Web site per day to track their packages, Hamilton said.

Since customers are not required to leave their names, Fed-Ex is not sure who visited but believes overseas customers ac-count for at least half of the hits.

Ainsworth said the Web site is set up to accept HTML queries through a customized Common Gateway Interface tracking-transaction application written in-house. Through a token-ring LU.0 interface, the query is then sent through an SNA Brixton Gateway to a mainframe database.

The challenge for the future will be setting up a series of distributed Web sites to handle an expected increase in queries, Ainsworth said. There appear to be few tools to accomplish that, but FedEx will experiment on its sites to find a way to do it.

As part of a larger Internet strategy, FedEx wants to be the shipper of preference advertised on Web sites, crafting the same sort of alliances it has outside of cyberspace. FedEx already does all of L.L. Bean Co.'s shipping for a reduced rate.

The FedEx brand name, and its on-line tracking skills, will translate well on the Internet, Janes said. In turn, the Internet will profoundly change FedEx.

"We may eventually phase out our proprietary software in place of the Internet," said Janesor he added that he can see the day coming when FedEx will have intelligent agents scouring the 'Net to collect information on FedEx shipment requests.■

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# Prudential takes the interworking plunge

**By Joanie Wexler**

*Newark, N.J.*

Prudential Insurance Co. of America is trying to gets its arms around the benefits of a new service that builds links among frame relay, ATM and other types of sites.

The financial giant last week said it has been testing AT&T's InterSpan frame relay-to-ATM service interworking offering, which became commercially available late last year along with DS3 ATM services.

The tests are aimed at laying the net groundwork for an anticipated explosion in bandwidth needs in 1997, said Bill Rush, Prudential's vice president of information systems.

"[The interworking service] is working fine for video and file-transfer applications," he said. "But we haven't really stress-tested it yet."

Rush said he discovered that "ATM lives," but it isn't quite ready for prime time. "There are network management issues, and some of the vendors' stuff really doesn't work," he said. As a result, Rush will probably wait until next year to deploy ATM for production use.

Prudential is now determining which network technology is appropriate for each of the company's many sites, which run a wide diversity of applications. This is where interworking comes in. Switches in the network convert traffic at sites running one technology into the format of the technology at the receiving location. So frame relay can be converted to ATM, X.25 to frame relay, X.25 to ATM and so on.

**Rush** *says he'll wait to deploy ATM for production use.*

This is important from a cost perspective because it allows users to use the most appropriate technology at a given location, rather than making equipment and service choices simply to get one common platform across their enterprise networks.

"The easiest thing to do would be to just buy dedicated DS3s to every site," said Rush. "But I'd get fired for spending too much money."

Still, surprisingly, he said he has no information about what ATM would cost Prudential. Rather, Rush said he views ATM as a way to break through frame relay's current T-1 speed ceiling.

Prudential's immediate goal is to make sure ATM and interworking actually work — and work reliably. Then the company hopes to discover efficiencies and cost savings by combining multiple traffic types on one fast ATM backbone, according to Rush.■

## CORRECTIONS

**Correction:** Our "Power Players" special issue (Dec. 25, 1995/Jan. 1, 1996) incorrectly listed the organization with which Steve Waldbusser is affiliated. He is principal architect for International Network Services in Mountain View, Calif.

**Clarification:** International Data Corp. of Framingham, Mass., was the source for the chart on Web server software shipments (Jan. 8, page 16).

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NETWORKS THAT GO THE DISTANCE

# Frame relay to finally kick up to T-3

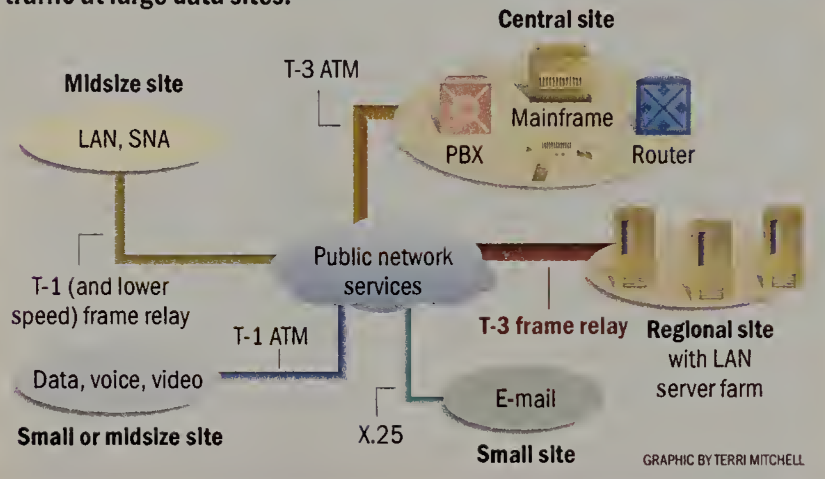
**By Joanie Wexler and Tim Greene**

Frame relay is about to get some big shots in the arm — not that it needs them.

The wildly popular packet networking technology soon will be further boosted by carriers such as AT&T, LDDS WorldCom and EMI Communications Corp., which are crafting a mix of T-3 speed service offerings, enhanced management services and some SNA service guarantees. In addition, the first voice over frame relay service was announced last week.

**Mixing and matching network services**

**Emerging T-3 frame relay services will soon be an option for handling traffic at large data sites.**



GRAPHIC BY TERRI MITCHELL

LDDS WorldCom is likely to launch commercial T-3 frame relay services in a matter of weeks. It is poised to turn on frame relay to ATM service interworking in March and the T-3 frame service will be available before then, said Emily Hansen, frame relay product manager. The company is already offering T-3 speed frame services on a custom basis to about 10 companies, she said.

Pricing would be "more economical than buying multiple T-1 speed ports and [permanent virtual circuits] to achieve the same bandwidth," Hansen said.

AT&T also is seriously considering a T-3 frame relay offering as well as fractional T-3 frame services, according to Bruce Tanzi, an AT&T InterSpan frame relay product manager. However, AT&T currently is not supplying services to any early customers. It will likely wait at least until standards for the User Network Interface for the higher speed service are nailed down and embraced by equipment vendors, he said.

"I see that gelling over the next month or so," he said.

### Coming full circle

Years ago, frame relay was conceived as a "fast packet" technology like ATM, in part because it originally was thought of in terms of broadband speeds. To users' chagrin, though, the T-3 speeds, while supported in the frame relay standard from Day One, have never materialized.

Many pundits thought this was a marketing ploy on the part of carriers that did not want to squelch user interest in ATM. But now, as the natural growth of corporate traffic progresses and most users have had positive frame relay experiences, it is time to bring out high-speed frame services, said Steve Taylor, president of Distributed Networking Associates, a consulting firm in Greensboro, N.C.

Higher speed frame relay would benefit customers with centralized host sites battered by aggregated data traffic from many distributed sites, he said (see graphic).

LDDS WorldCom seems to have gotten the message, and its service is closer to deployment than AT&T's. The approach will include partnering with the customer in putting appropriate DS3 frame relay equipment on their premises to take advantage of the service.

Meanwhile, other frame relay services are queuing up. AT&T's Tanzi said users can expect more sophisticated management capabilities on their InterSpan frame relay networks this year. For instance, users will be able to select a section of their network to monitor permanent virtual circuit (PVC) and traffic statistics.

Voice over frame relay service is also on the horizon. EMI said last week it has teamed with equipment maker ACT Networks, Inc. to deliver voice over frame offerings. Users might see such services first from dedicated frame service providers, such as EMI and other members of the UniSpan frame relay consortium, as these companies currently lack a voice offering.

### Standards in the making

AT&T's Tanzi said a draft ballot is expected by year-end for voice over frame relay standards that specify how different customer premises equipment makers handle traffic prioritization and encapsulation. Central office-scale versions of the voice-oriented frame relay access devices are also needed before full services can begin, he said.

Eventually, such services will dedicate a user's PVC to voice frame relay, Tanzi said.

EMI's product development director, Mark Pugerude, said his company will use a similar tactic for offering reliable SNA over frame relay — a service his company will announce at ComNet next week. ■

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# Lotus' applet strategy takes shape

**By Carol Sliwa**
*Orlando*

Lotus Development Corp. will unveil at least a half-dozen mini-applications — sometimes referred to as applets — this week at its annual Lotusphere customer conference here.

The components, derived from Lotus SmartSuite, include project scheduling, spreadsheets and charts, sources said.

Lotus' line of component software will be packaged and sold either shrink-wrapped or downloadable from the World-Wide Web, sources said.

The company, based in Cambridge, Mass., would not comment on the pricing scheme. But sources familiar with the new product line said compared to the cost of a full-blown application, the components will be available for a nominal fee. One source likened the setup to cable subscriptions, whereby customers buy a basic no-frills package and then tack on extras as Lotus develops them.

Sources said end users will be able to access the components via icons and pulldowns from within Notes, and the applet or component then can be embedded inside a Notes document or form.

For example, a Notes user wanting to set up a meeting with a colleague could embed a scheduling applet inside a Notes document and send it off. The recipient could double-click on the document and have a scheduling mini-application to slip a date into, without having to launch an external application.

When Lotus announced its component plans last fall, industry observers saw the move as Lotus' white flag in the suite war that Microsoft has been winning with its popular Office product. But even as Lotus tries to redirect the battlefront with the applets, it has no plans to abandon SmartSuite, sources said.

Plans call for the SmartSuite line to be more closely integrated with NotesRelease 4. ■

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# PowerPC engine to drive IBM network product line

**By Michael Cooney**
*Raleigh, N.C.*

IBM last week said it will adopt PowerPC technology for use in many of its communications products in an effort to cut costs, improve performance and speed new features to market.

The PowerPC technology, which IBM said will appear in products over the next 12 months, will be particularly important as IBM tries to reduce product prices to entice customers into the world of Asynchronous Transfer Mode.

DANILLE SWICK

**"The PowerPC will be the basic building block of all our networking products going forward."**

*Daniel Abensour*

The technology will also let the company offer more powerful controllers — such as the 3172 gateway, which is based on an Intel Corp. Pentium engine — and a common line of adapter cards for PCs and hubs. Since IBM manufactures and sells the PowerPC, it should be able to build and sell lower priced equipment with the homegrown technology.

Today's IBM network processors use a variety of technologies, from Pentium to Motorola, Inc. processors.

Standardizing on the PowerPC would let "IBM to develop common code that would run across a diverse set of products, rather than having separate teams developing software for each system. It's a smart, albeit overdue, strategy," said Steve Joyce, vice president of marketing at Ganymede Software, Inc., a network performance testing and consulting firm in Research Triangle Park, N.C.

Beneficiaries of the PowerPC movement will include the 8260 Intelligent Hub, the 3172 Interconnect Controller and the 3746 Model 900 front-end processor.

According to Daniel Abensour, IBM program director of ATM market development, the 8260 already uses some PowerPC technology in its interface modules. The processor is also expected to be the central component of a new 25M bit/sec ATM Workgroup Switch IBM is expected to unveil at ComNet '96 (*NW*, Jan. 15, page 6).

Experts said shifting existing communications devices and adapters to the PowerPC engine would also require a corresponding change in software. They noted, however, that depending on how IBM rolls out the PowerPC packages, it should not be a big issue for users. IBM did not provide rollout details.

"The operating systems would need to become 32-bit [or 64-bit], but backward compatibility shouldn't be a problem," Joyce said. "The products should be screamers once implemented."

The use of the PowerPC across multiple product lines represents a corporate directive in that IBM wants its divisions to share technology. Its use also will give the platform an image boost. IBM, Apple Computer, Inc. and Motorola began the PowerPC effort in 1991, but the initial fanfare has long faded. Development delays and implementation issues have slowed its deployment. ■

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# New choice in frame relay: switched voice

**By Tim Greene**
*Herndon, Va.*

With users drawn to the prospect of voice traffic riding for free over existing enterprise frame relay links, vendors are clamoring to provide the necessary hardware.

A bit ahead of the curve, Netrix Corp. plans to premiere its technology, called Switched Frame Transfer Mode (SFTM), at ComNet '96 next week with the introduction of a multiprotocol packet assembler/disassembler called the 2210.

Users will be able to mesh their networks using fewer lines by virtue of the SFTM switching capability and realize savings up to 30%, the company said.

The platform can be installed on most of Netrix's current product line and will be incorporated in new products to be introduced later this year.

The switched technology represents the latest fruit of Netrix's 1994 purchase of Republic Telcom Systems Corp., which brought voice compression technology to Netrix, according to Rick Malone, principal at Vertical Systems Group, a consultancy in Dedham, Mass.

The voice capability gives rise to the switching, he said.

"Voice requires users to mesh and have SVC support in the network. Without switching, you would need a PVC to every other location in a network at a cost of $50 to a couple of hundred dollars per month, depending on the size," Malone said.

Curtis Price, an analyst with International Data Corp. in Framingham, Mass., said the Netrix products are designed to tie in all branch office traffic. This could well be a trend.

"If this takes off, there will be lots of other vendors doing this," Price said.

Netrix will demonstrate switched voice over frame relay at ComNet, although that capability will not be commercially available in a product until the third quarter, according to Chris Nicoll, a member of the Netrix business development team.

The 2210 combines the multiprotocol capabilities of Netrix's PAD line — including asynchronous, X.25, frame relay and LAN support — on a high-capacity chassis, Nicoll said.

Pricing for the 2210 starts at $5,000 with four ports and goes up to about $25,000, which includes 30 serial ports plus a LAN port.

Four cards are available: high-speed and low-speed four-port cards, and eight-port low-speed synchronous and low-speed asynchronous cards. A voice card will be available later this year, Nicoll said.

One of the offerings in the line is the next iteration of the Netrix 1-ISS Series 10 multiprotocol backbone switch, which supports frame relay, X.25, time-division multiplexer and other protocols through any port, Nicoll said.

©Netrix: (703) 742-6000.

COMNET PREVIEW

# Ascend unveils new remote access device

**By Jim Duffy**
*Alameda, Calif.*

Ascend Communications, Inc. last week unveiled a remote access router that may convince cost-conscious users to ditch increasingly expensive ISDN lines for leased circuits.

### Drilling down into Pipeline 130

**Features:** 1 Ethernet AUI; 2 WAN ports supporting frame relay, ISDN, switched and dedicated 56K bit/sec, T-1 and fractional T-1

**Applications:** Remote LAN access, Internet access

**Price:** $1,895 to $1,995

**Available:** Now

Ascend's Pipeline 130 features integral data service unit/channel service unit (DSU/CSU) and ISDN NT1 transmission capabilities, which enable users to simultaneously transmit data over ISDN and leased frame relay circuits. It also lets them gradually migrate their dial-up access circuits to leased lines, a feature that may be appealing for ISDN users if regional Bell operating companies get their way and hike rates for those services (*NW*, Jan. 15, page 1).

"Customers can start with [an ISDN Basic Rate Interface] and migrate to dedicated lines, avoiding forklift upgrades and reducing the total cost of ownership," said Bernie Schneider, vice president of marketing at Ascend.

Conversely, the Pipeline 130 allows users to migrate from their dedicated circuits to ISDN pipes should ISDN prove more cost-effective.

**Lookin' good**

"It looks great to me," said Ascend customer Kirk Ebensteiner, technical services manager at US WEST, Inc. "It's very cost-competitive, particularly the integrated T-1 DSU/CSU [and] support for frame relay and ISDN."

Ascend is going up against the likes of 3Com Corp., Advanced Computer Communications, Cisco Systems, Inc., Gandalf Systems Corp. and Motorola, Inc. in the remote access market.

Analysts believe the Pipeline 130 will make those competitors stand up and take notice.

"The way they're going to do it is by having these products that are technologically superior at a lower price point," said Maribel Lopez Howard, research analyst for data communications at International Data Corp. in Framingham, Mass.

Ascend claimed comparable products from its competitors cost almost $2,000 more than the Pipeline 130.

According to Howard, Ascend can also leverage its presence in Internet Service Provider sites.

©Ascend: (510) 769-6001.

# Promptus to introduce low-end inverse mux

**By Jim Duffy**
*Portsmouth, R.I.*

At ComNet '96 next week, Promptus Communications, Inc. will unveil a low-cost remote access device that functions as an ISDN terminal adapter and inverse multiplexer for videoconferencing applications.

The Oasis 100 is designed to provide flexibility and ease-of-use at a low entry price point for videoconferencing applications. The Oasis 100 can also be used to provide low-cost access to ISDN services for LAN internetworking.

Oasis 100 comes equipped with one ISDN Basic Rate Interface that supports the Bandwidth-On-Demand Interoperability Group inverse multiplexing standard, which enables the products to support one 128K bit/sec or two 64K bit/sec calls. Users can also add an optional three-port BRI module to the Oasis 100, which brings the BRI count to four and overall bandwidth — through inverse muxing — to 512K bit/sec.

Oasis 100 also includes two data/dialer ports, which connect a videoconferencing system to the unit, an RJ-11 console port and an external power supply. The data/dialer ports support V.35/RS-449, RS-366 and X.21 interfaces.

For low-speed videoconferencing at 128K bit/sec, the Oasis 100 only functions as an ISDN terminal adapter because most video coder/decoders utilize an internal inverse multiplexing scheme at this speed, Promptus said. For videoconferencing at 512K bit/sec, the Oasis 100 functions as an external inverse mux, splitting bandwidth across multiple ISDN BRI circuits.

To ease configuration, the device comes with a Windows-based application, called ISDN Wizard, that leads users through a step-by-step process of setting up Oasis 100. Users more experienced with configuring ISDN equipment can bypass ISDN Wizard and use a command line interface from any VT 100 terminal to set up the Oasis 100.

Oasis 100 is intended to go up against Ascend Communications, Inc.'s Multiband VSX BRI and Adtran, Inc.'s ISDN Service Unit (ISU) line. The Multiband VSX BRI has a single BRI in the base unit and a three-port BRI expansion module for 512K bit/sec of inverse muxed bandwidth.

Adtran's ISU 512 will inverse multiplex up to four ISDN BRIs to support a single data link at up to 512K bit/sec. It costs about $3,000.

Promptus' Oasis 100 costs $1,995, and the three-port BRI expansion module costs $1,000. Oasis 100 will be available in April.

©Promptus: (401) 683-6100.

**Cellular service costs**

# GTE slashes prices of CDPD service

**By Joanie Wexler**
*Atlanta*

GTE Mobilnet last week cut its Cellular Digital Packet Data service rates in half. The move could kick off a trend nationwide for lower, simplified prices from all CDPD carriers. Its new rates give users 1,000K bytes of usage each month for a flat fee of $49.95.

The effort to lower overall prices is likely to succeed, analysts said. Several carriers, including key competitors AT&T Wireless Services and Ameritech Cellular Services, have said they plan to dramatically drop CDPD prices this year to spur use of the service as an Internet access alternative (*NW*, Jan. 8, page 24).

With the drop, GTE has severely undercut competitors such as AT&T Wireless and Ameritech Cellular, and operators of other types of packet radio nets such as ARDIS Co. and RAM Mobile Data.

**Predictable monthly bills**

GTE Mobilnet now has a pricing model similar to AT&T Wireless' — a flat monthly charge for a certain number of kilobytes transmitted plus a per-kilobyte charge above the ceiling. The goal with the pricing structure is to deliver predictable monthly bills.

For example, users on an entry-level GTE Mobilnet plan would pay $15 a month for up to 125K bytes, or about 24 pages of text.

What remains to be seen i how big a factor price has playe in users' hesitation to buy int CDPD. Lower prices "will defi nitely stimulate interest in wire less data applications," said Phi Evans, director of telecommun cations at Perot Systems Corp. i Dallas.

But there are other importa factors such as coverage.

"I can't tell my truck driver t upload at 5th and Main in th morning and at 127th and Ce tral in the afternoon becaus that's where the only two CDP towers in town are," said Ti Schmidt, a principal at Enco Consulting, Inc., a wireless co sulting firm based in Longwoo Fla. ■

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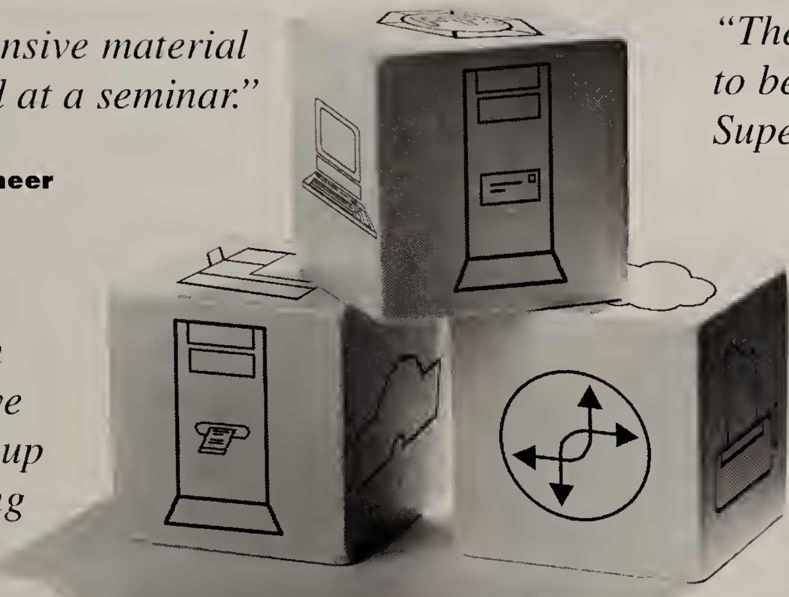

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## Presented by Ray Horak

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# Fundamentals of NETWORKING

## & DATA COMMUNICATIONS

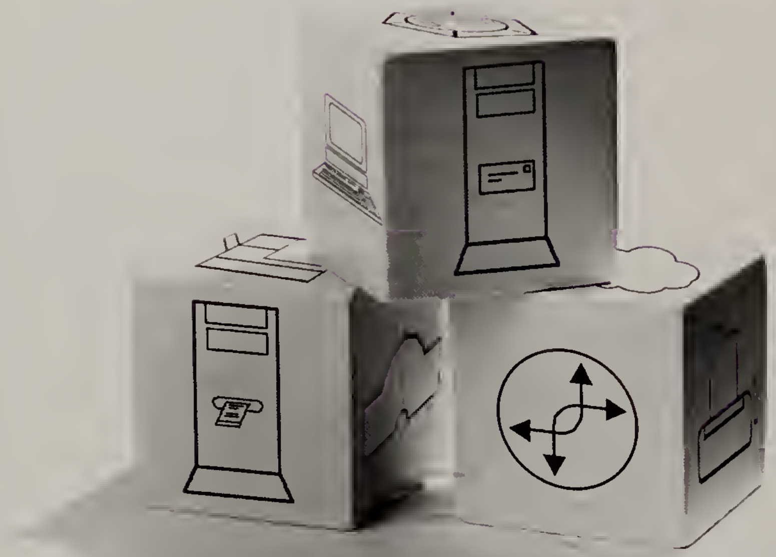
Networks and telecommunication systems are evolving with ever-increasing speed. The voice networks that remained essentially unchanged and intact for a hundred years are yielding to the Information Superhighway of the future.

While the current and future systems and network technologies are engaging, the options are broad in range, complex in nature and ultimately confusing. Standards are slow to develop and even slower to be implemented. Interconnectivity is by no means a trivial issue and, certainly, cannot be taken for granted; interoperability is still largely a vision. Hardware manufacturers, carriers, service providers and end users see the "Network World" very differently. Federal, state and local regulatory jurisdictions overlap and policies often conflict. Users have developed a voracious appetite for bandwidth, but are learning that there are no free rides on the Information Superhighway.

Ultimately, the technologies, however engaging, are only enablers. The technologies must support meaningful applications which address real and current business requirements in a cost-effective manner. Furthermore, they must provide a smooth transition path to the near and distant future—broadband networking, convergence and the like. If all of this seems confusing, it is because it is confusing!

*Fundamentals of Networking & Data Communications* is a dynamic, fast-paced, plain-English, common-sense and thoroughly understandable explanation of current and developing communications systems and networks. Acronyms are decoded, technologies are de-mystified, standards are put in perspective and regulatory issues and trends are explained. The present and future "Network World" is set in the context of meaningful and cost-effective business applications.

Directed and presented by Ray Horak, an internationally acclaimed network consultant, author and lecturer, this two-day seminar is informative and entertaining. The extensive and highly narrative course workbook includes every slide contained in the presentation. This seminar provides a firm foundation for understanding the "Network World."



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## Attending this two-day seminar will help you . . .

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- Understand the technology and regulatory concepts underlying the evolution of contemporary networks, both voice and data
- Grasp the fundamentals of transmission systems from analog to digital, from twisted pair through fiber optics and from wired through wireless
- Comprehend the basics of data communications protocols: line set-up, coding schemes, asynchronous vs. synchronous, error detection and correction, etc.
- Understand the evolution of data networking, from DDS and X.25, through T/E-Carrier, ISDN, SMDS, frame relay, ATM and B-ISDN
- Discover the infrastructure issues and technology shifts leading to SONET/SDH and fiber/coax/copper/wireless hybrid transport
- Learn the nature of current and developing local loop technologies, as well as their advantages and drawbacks
- Explore the integration of Internet services and applications within your information infrastructure
- Understand the differences between circuit, packet, frame and cell switching
- Develop an informed and meaningful strategy for the transition to broadband networking through SMDS, frame relay and ATM
- Compare and contrast the options for wireless data networking in the LAN, MAN and WAN domains
- Determine the status of video and multimedia communications, for application in a practical business context
- Develop a sense of carrier options—LECs, CAPs/AAVs and IXCs—as well as technology alternatives
- Track the development of network convergence, with an eye toward interactive applications
- Develop an informed and meaningful strategy for the deployment of emerging technologies, in the context of effective business applications

### Who Should Attend

- Those new to data communications seeking a firm foundation of knowledge
- MIS/DP professionals requiring an overview of communications fundamentals and trends
- Experienced communications professionals requiring an update of their knowledge of current technologies, as well as an understanding of emerging system and network technologies and applications
- Non-technical professionals in the disciplines of marketing, public relations, sales, education, law and finance
- Decision makers seeking a big-picture perspective of broadband, high-performance networks
- Manufacturers, distributors and carriers who wish to broaden their perspectives and sharpen their vision

## About The Presenter

*Ray Horak*

**PRESIDENT,**
**THE CONTEXT CORPORATION**

Ray Horak is President of The CONTEXT Corporation, which provides strategic-level consulting and education services to the manufacturer, distributor, carrier, consulting and end-user communities. Horak has been immersed in telecommunications since 1970, with management experience at Southwestern Bell, AT&T and Bell Labs. He held senior management positions with CONTEL Telephone Operations, CONTEL Tenant Services, CONTEL Executone and Communications Group, Inc.

Mr. Horak is an internationally recognized communications consultant and lecturer who speaks annually before thousands of communications professionals through his seminars and conference appearances in North America and abroad.

He is a regular contributor to a number of leading industry trade publications and serves on numerous Advisory Boards for Datapro Information Services, and has served on numerous conference Steering Committees, including worldwide ComNet Conferences and The Information Superhighway Summit. Mr. Horak holds both B.B.A. and M.B.A. degrees from the University of Texas at Austin.

## $895 Registration Fee Includes . . .

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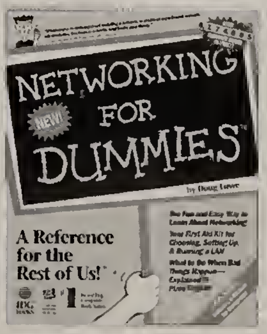

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# Fundamentals of NETWORKING
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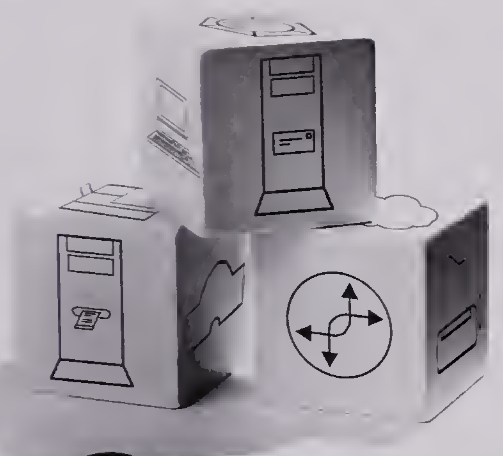

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# *Seminar* OUTLINE

### FUNDAMENTALS OF DATA NETWORKING

Regardless of the native form of the information being communicated across a contemporary network of any significance, it is generally transported and switched as a data stream. Therefore, the concepts, technologies, standards and regulations which underlie and impact data communications are increasingly essential to the development, and even survival, of the business enterprise.

This seminar provides a comprehensive, understandable and common-sense basis for the development of reasonable business strategies which take maximum advantage of current and developing network technologies.

- Data Communications Overview
- Voice, Data, Video and Image— It's ALL Data
- Bandwidth, and the Applications which Consume It
- Broadband Networking as the Solution
- Computers and Communications Come Together: The Information Superhighway, Real Products or Empty Promises?

### TECHNOLOGY BASICS

A solid foundation in technology basics is essential for understanding the complexities of Data Networking. This section lays the groundwork through a plain-English discussion of fundamental concepts.

- Transmission Fundamentals
- 2-Wire, 4-Wire Circuits
- Bandwidth Analog vs. Digital Transmission
- Amplifiers vs. Repeaters
- Multiplexers
- Switching Basics

### TRANSMISSION BASICS

The fundamentals of transport systems must be understood in order to appreciate the limitations they impose on communications networking, as well as the opportunities they present. This discussion of the physical layer of traditional infrastructure will include twisted pair, coax and fiber optic cabling, as well as airwave and hybrid alternatives. Issues of bandwidth, error performance, security and cost will be compared and contrasted.

- Twisted Pair
- Coaxial Cable
- Microwave
- Satellite
- Fiber Optics
- Wireless
- Hybrid Networks

### DATA COMMUNICATIONS BASICS

This section addresses the final stage of fundamental understanding, the basics of data communications. These definitions and concepts extend across all technologies and service offerings.

- CPE/DTE
- Modems and Codecs
- Terminal Adaptors and NT-x's
- Protocol Basics
- Security

### DATA NETWORKING OVERVIEW

Despite its severe limitations, all data initially traveled the voice network. As the demand for data networking developed, and as technology evolved, a number of alternatives emerged. This section addresses the evolution of current and emerging data networking technologies and service offerings, including dedicated, switched and channelized, as well as packet, frame and cell switched networking.

- Evolution of Data Networking
- The Voice Model
- Data over Voice Networks
- Data over Data Networks
- Data Networking on the WAN
- Dedicated (DDS)
- Circuit Switched (Switched 56/64, ISDN)
- T/E-Carrier
- Packet Switched (X.25...)
- Frame Switched (Frame relay)
- Cell Switched (SMDS, ATM, B-ISDN)

### DATA NETWORK DOMAINS—OVERVIEW

A solid comprehension of data network domains is critical to developing an understanding of broadband networking. In this section, we will discuss the distinctions between various network domains of geography, carriers and service providers, regulatory authority and function. Clear delineations will be provided and the relationships between the various domains will be discussed.

- Geographic Domains
  - Local Area Networks (LANs)
  - Metropolitan Area Networks (MANs)
  - Wide Area Networks (WANs)
  - LAN Internetworking
  - The Internet
- Regulatory Domains/Issues
  - Local/State
  - National
  - Regional
  - International
- Carrier Domains
  - PSTN
  - LATA Concept
  - Local Exchange Carriers (LECs)
  - InterEXchange Carriers (IXCs)
  - CAPs/AAVs
  - Overlay Carriers
  - Wireless Carriers
- Functional Domains
  - CPE/DTE
  - Access (Demarc/Local Loop)
  - Transport
  - Signaling & Control Systems (SS7)
  - Service Provisioning

### LANs AND LAN INTERNETWORKING

Currently perhaps the single most significant driving application for emerging broadband networks is that of LAN internetworking. This discussion of the basic concepts of LANs and LAN internetworking serves as the launching pad for the network technologies of the future.

- Evolution of LANs
- LAN Standards and Standards Bodies
- LAN Dimensions
- Media Types
- Physical and Logical Configurations
- Broadband vs. Baseband LANs
- Bridges, Routers, Hubs and Switches
- LAN Internetworking

### BROADBAND NETWORKING

Broadband networking addresses the near and distant future of telecommunications—the need for speed! Reliability, resiliency, flexibility and even mobility are also desirable and even critical. Discussion of transport technologies and signaling systems set the stage for an in-depth presentation of the latest in data network services.

- Local Loop Technologies
  - HDSL
  - ADSL
  - MDSL
- SONET/SDH
- Signaling System #7 (SS7)
- Frame relay
- SMDS
- ATM
- ISDN & B-ISDN
- AINs

### WIRELESS DATA NETWORKING

No discussion of data communications would be complete without addressing the need for mobility. Wireless communications alternatives have been developed only relatively recently and, in fact, are still in the early stages of development and deployment. While the presence of wireless data networking is limited, the future holds real promise.

- Data over Cellular Networks
- Wireless Data Networks
- Wireless LANs
- PCS/PCN
- LEOs, MEOs & GEOs

### VIDEO AND MULTIMEDIA COMMUNICATIONS

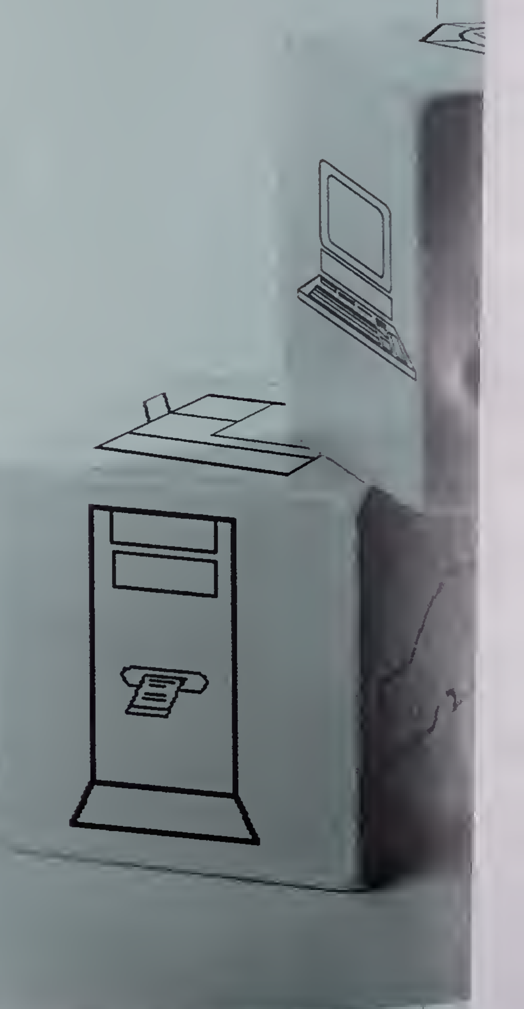
Data networking is certainly the driving application force behind the development and deployment of contemporary broadband networks. There would appear to be little question, however, about the fact that video communications is greatly appealing. Complementing and enhancing a data communication between end users with video will ultimately result in a multimedia dialogue, in real-time—the applications are many and are truly compelling. Case studies will be presented in a video format.

- Visual and Video Communications
- Video Systems and Transmission
- Video Storage and Computing
- Multimedia Overview

### NETWORK CONVERGENCE: VOICE, DATA AND VIDEO/ENTERTAINMENT NETWORKING

The concept of the Information Superhighway is one that will eventually yield converged networks to support voice, data, video and entertainment networking over a single physical infrastructure. Competition to build the infrastructure is heavy among the LECs, IXCs, CATV providers and electric utilities, with some amount of cross-pollination. Relationships with content providers are being formed, although with difficulty as the cultures clash. Software developers and manufacturers of wireless systems are working feverishly to develop effective user interfaces. At some level, network convergence must be taken very seriously by the data network professional.

- Network Infrastructure
- Terminal Devices
- Content
- Applications
- Status and Trends



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Registration for this seminar will begin at 8:00 a.m. on the first day of the seminar. The seminar will begin promptly at 9:00 a.m. and will end at 5:00 p.m. on both seminar days. The seminar meeting room will be posted in the hotel lobby. The luncheon room location will be announced at the seminar.

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We have reserved a limited number of overnight rooms on an individual call-in basis at each hotel for seminar attendees. If you require a room, please contact the hotel listed on your seminar confirmation form as soon as possible since the rooms are held for a limited time. When calling, please indicate that you will be attending the *Network World Technical Seminar* in order to receive a preferred room rate.

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> *"John, as usual, provided an excellent presentation. His presentation technique and style are both informative and insightful."*
>
> **Vishal Desai,**
> **Network Manager**
> **NASA**

> *"Good job of talking about the value of this technology relative to user requirements."*
>
> **Bill Erdman,**
> **Senior Product Manager**
> **Cisco Systems**

> *"John knows our pressing needs and addressed them."*
>
> **Bryan Duemler,**
> **Senior Systems Programmer**
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4. Explore new developments in monitoring switched networks
5. Analyze when to use Layer 2 and Layer 3 switching
6. Learn about LAN Emulation as a means to interconnect LANs
7. Explore the complete scope of emerging Virtual LAN technologies. All VLANs are not the same: evaluate the tradeoffs and determine which one works for you
8. Learn about the newest developments in MPOA (Multi-protocol interconnections with ATM)
9. Find out what leading switching vendors products and strategies will work best in your environment
10. Learn about the new routing strategies for interconnecting switched workgroups and virtual LANs
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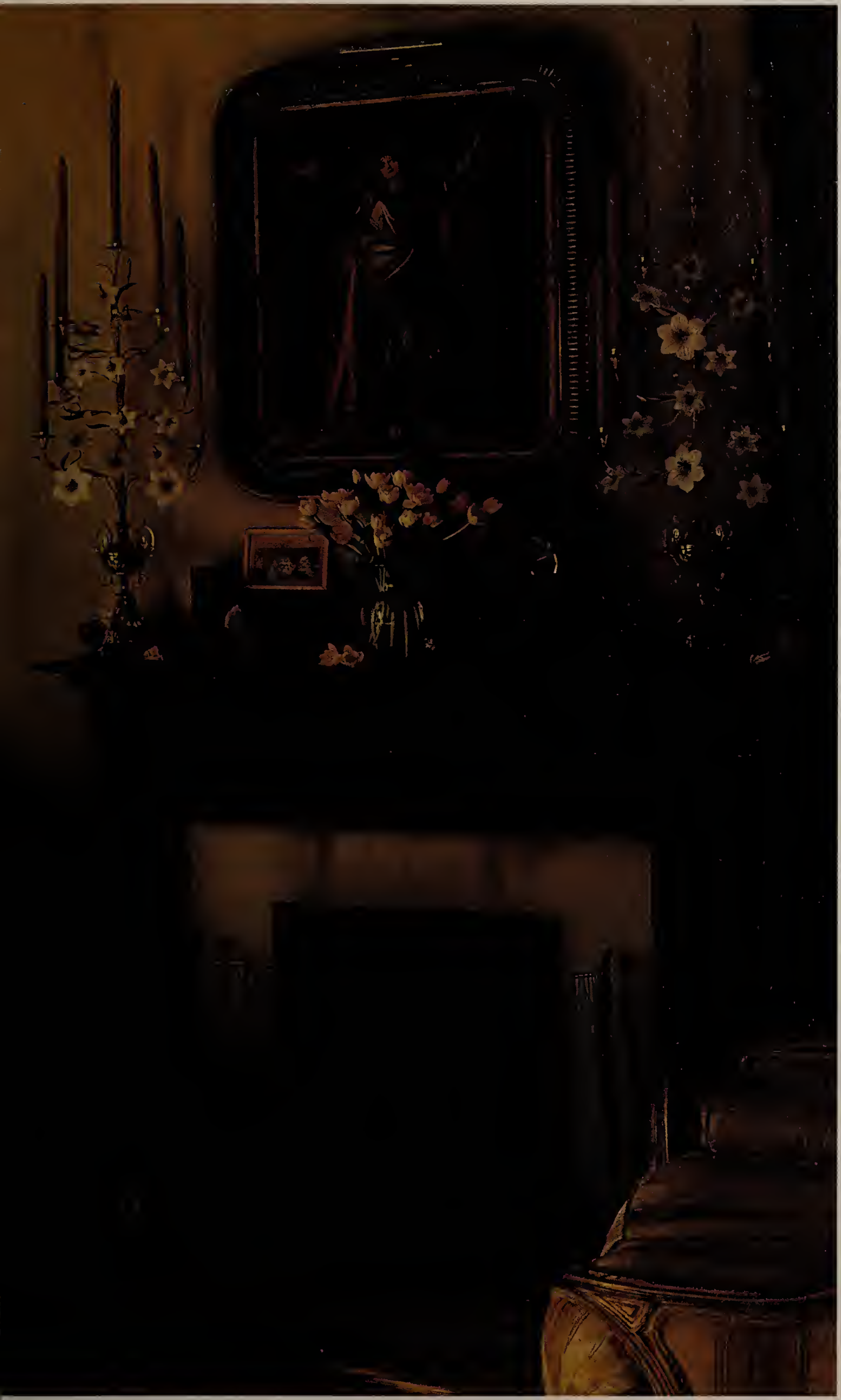

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## Briefs

■ **Sync Research** *last week added new, lower priced hardware to its FrameNode family of* **frame relay access devices (FRAD).** *The company unveiled new two- and four-port versions of its FrameNode 4200, which mixes its existing FRAD prioritization and congestion control features to let users more effectively consolidate and link branch office SNA and LAN traffic over frame relay links.*

*The FrameNode 100 single-port FRAD and the three-port FrameNode 2200 also were rolled out. Both are designed for users that only need to link SNA/Synchronous Data Link Control or bisynchronous traffic to the frame relay net.*

*The 4200 FRADs are available starting at $1,995. The FrameNode 100 and 2200 will be available by March for $995 and $1,795, respectively.*

*Sync: (415) 525-2603.*

■ **Visual Networks, Inc.** *last week unveiled an* **Internet access device** *that lets users monitor usage of access circuits for accounting, problem resolution and bandwidth planning.*

*Called Visual OnRamp, the product is comprised of a customized data service unit/channel service unit (DSU/CSU) and Windows-based application software. The DSU/CSU combines the functionality of a protocol analyzer and transmission monitor, and supports the Simple Network Management Protocol.*

*Visual OnRamp costs from $1,995 to $2,995, depending on configuration. It will ship in March.*

*Visual Networks: (301) 208-6784.*

■ **ADC Kentrox** *will introduce at ComNet '96 additions to its SMARTools Kit, a Hewlett-Packard Co. OpenView* **network management tool.** *SMARTools Manager manages DataSMART T-1 Multimedia Access Multiplexers, DataSMART T-1 data service units/channel service units (DSU/CSU) and T-SMART CSUs using Simple Network Management Protocol commands.*

*ADC Kentrox: (503) 643-1681.*

## Sprint backbone suffers from Internet outages

**By Joanie Wexler**

Ever been out in the cold because a hotel or an airline sold more rooms or seats than they actually had available and then everyone showed up?

Welcome to the modern version of this practice: the Internet service provider (ISP) that oversells bandwidth to users who occasionally all try to hop on the network at the same time.

In recent weeks, oversubscribed bandwidth combined with a lack of redundant connections has brought some 'Net linkages — particularly those running across the Sprint Corp. backbone — to their knees.

Although SprintLink, Sprint's Internet service, is usually "reliable as heck, its performance was horrible" for at least a week early this month, said Bob Hoquim, owner of IQuest Internet, Inc., a smaller ISP in Indianapolis. "They oversold their bandwidth too many times. The on-ramps were stuffed."

This can break connections if delays are too long and packets time out, he explained.

Another problem is infrastructure. Sprint's and MCI Communications Corp.'s Cisco Systems, Inc. 7000 routers simply reach their capacity limit during certain times of the day. And the protocol layer that tells the router tables to change "is just getting too big and collapsing" — a phenomenon called route-flapping — said James Domengeaux, principal at ComSpace.com Internet Services, a World-Wide Web design firm in Houston that had trouble with the Sprint net this month.

The router problems should abate when the carriers upgrade to Cisco 7500s, he said.

Alecia Cooper, SprintLink product management group manager, said the carrier is immersed in a "massive build-out" of Cisco 7513s now. Over the next several months, components for the 7513 will become available from Cisco to give it about five times the capacity of the 7000, she said.

Cooper said she is not aware of specific outages in Sprint routers this month but acknowledged that route-flapping caused many SprintLink problems last fall.

### Tracking down the culprit

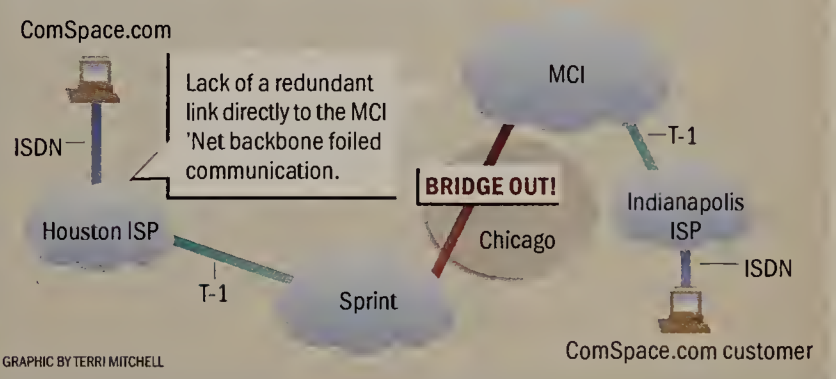
Domengeaux said for about a week earlier this month, he was unable to get to clients' Web sites in part because a Sprint-to-MCI bridge in Chicago was out. Domengeaux used an application called TraceRoute to discover which router in the series of network hops — a Sprint router connected to the MCI backbone — was the malfunctioning culprit.

In addition, his ISP in Houston connects only to the Sprint

*See* **Sprint,** ***page 22***

### YOU CAN'T GET THERE FROM ANYWHERE

**The Internet often does not have the backup links users might expect from a corporate WAN. This can result in communications outages, as it did for Web designer ComSpace.com earlier this month.**



GRAPHIC BY TERRI MITCHELL

## ISDN rate hikes confound users

*Price increases could jeopardize demand for the service.*

**By Tim Greene**

FOLLOW UP

ISDN price hikes proposed by several RBOCs have users livid and analysts scratching their heads.

Both groups are trying to understand why carriers would jack up prices at the precise time they might expect users to embrace the dial-up digital technology.

ISDN users — many of whom want the service for 64K or 128K bit/sec access to the Internet — have taken to posting their gripes on the World-Wide Web.

In particular, users are angry about proposed rate increases by Pacific Bell and US WEST, Inc. Pacific Bell wants to restore its installation fee plus boost its per-minute fee. US WEST wants to set new fixed-price usage options in Washington state, with the unlimited-use option at triple the current cost.

Meanwhile, users in the Bell Atlantic Corp. region are pushing for residential ISDN rates that are closer to the rates for standard voice service.

"My company was about to switch to ISDN for our Internet

*See* **Rate hikes,** ***page 22***

## Bay focuses on stackable modular gear

**By Jim Duffy**

*Framingham, Mass.*

Bay Networks, Inc. this year will develop internetworking products in three configurations that leverage both the company's recently announced BayStack strategy and the modularity of the LattisSystem 5000 hub.

The configurations will encompass small and midsize stacks, and modules for chassis-based platforms, said Steve Collins, director of product marketing for Bay. The strategy is intended to drive down product development costs and increase volume, he said.

"BayStack is a miniversion of what we're going to do throughout the product line," Collins said. "By the end of the year, you'll see hubs, routers, switches and remote access products in those form factors."

BayStack is a low-end offering that currently includes 10Base-T and 100Base-T hubs, an Ethernet workgroup switch, as well as access routers and routing hubs. BayStack is targeted at workgroups and remote office applications, while the System 5000 is aimed at LAN backbones and wiring closets.

One of the new switches Bay plans to roll out this year is an Ethernet desktop switch sporting at least 16 ports, Collins said. Though it is a desktop switch, it will support more than one media access control address per port, he said.

Bay's desktop switch will emerge in the second half of this year, according to Collins. Bay customers can use the switch as part of a "hybrid" high-performance Ethernet configuration whereby multiple desktop switches are linked to a 100M bit/sec shared-media hub. This is then linked to a switched 10/100M bit/sec Ethernet backbone comprising Bay's LattisSwitch 28115 or other vendors' switches, Collins said.

For enterprise networking requirements, meanwhile, Bay is working on a 10G bit/sec Asynchronous Transfer Mode version of the System 5000 — known as the 5000Z — that leverages tech-

*See* **Bay Networks,** ***page 23***

### BAY'S NEW YEAR RESOLUTIONS

- ▶ Bring out hubs, routers, switches and remote access gear in stackable and modular form factors
- ▶ Deliver a desktop Ethernet switch with at least 16 ports by second half
- ▶ Deliver QoS-based routing in second half
- ▶ Continue work on 10G bit/sec "5000Z" ATM switch
- ▶ Size up opportunities in WAN access switching and gigabit routing

## Rate hikes

*Continued from page 21*

connection, but the proposed tripling of fees would make that uneconomical," wrote David Dunham of Pensee Corp. in Seattle.

Users also are bringing up old gripes that carriers haven't made it easy to get ISDN service. As Dunham said about US WEST's ISDN, "It's difficult to find anyone in the company who can spell it."

Analysts said moves by Pacific Bell and US WEST to boost prices would drive down demand, and the regional Bell operating companies themselves agreed that ISDN demand is price-sensitive.

Last year, a proposed $3-per-month increase to be imposed by the Federal Communications Commission drew protests from the RBOCs. They argued that the relatively modest increase would hobble the demand for ISDN just as it was hitting its stride.

In explaining its proposed increases, Pacific Bell said more customers than expected live over three miles from the nearest ISDN-capable central office, which means costly extra provisioning.

But Sanjay Mewada, an analyst at The Yankee Group in Boston, said those costs could be reduced by using an overlay network that back-hauls the service from ISDN-equipped switches — a model that SBC Communications, Inc. is using.

And even if provisioning is expensive, RBOCs should push the technology now with attractive pricing. "If it means losing money or breaking even to get penetration, then I think they should do it," Mewada said.

Pacific Bell also said about 30% of its ISDN customers are turning on the service on Friday night and using it nonstop all weekend, often for Web browsing from home. This can tie up the net. The way around that for SBC is selling tiers of service: $45 per month for 10 hours of usage; $63 per month for 80 hours; and $92 for unlimited time. US WEST is trying to adopt a form of that model, but its proposed unlimited charge is $184 — the cause of much of the howling about its hikes.

US WEST prices also would include a 200-hour package for $68, the one that 70% of users would want, a company spokesman said.

John Flower, director of data services for SBC, said he could understand price hikes if an RBOC had been operating off an experimental tariff and found the prices too low. And he noted that switch upgrades are expensive.

"[But] the last thing I want to do is restrict the number of people who use it. Why would I want to price in a way that would restrict its growth in the marketplace?" he asked. ■

### The many prices of ISDN

**Even without proposed increases by some RBOCs, monthly ISDN prices vary widely. And within a single RBOC territory, per minute prices vary.**

| RBOC | Representative ISDN prices |
|---|---|
| Ameritech | **$35** plus a variable per-minute voice rate |
| Bell Atlantic | **$20** plus 3 cents/min per B channel |
| BellSouth | **$45** plus variable per-minute charges |
| NYNEX | **$30-$35** plus variable usage |
| Pacific Bell | **$24.50** plus/1.05 cents per-minute voice charge |
| SBC | **$46** for 10 hours; 4 cents/min after that |
| US WEST | **$55** plus 15 cents/min or $64 flat rate |

GRAPHIC BY TERRI MITCHELL

SOURCE: THE YANKEE GROUP, BOSTON

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## Sprint

*Continued from page 21*

net and does not have a redundant connection to the MCI net (see graphic, page 21). Most ISPs do not have such connections; finding one that does could make a big difference in network reliability and could be a key criterion for corporate connections, he said.

**Shopping list**

In addition to seeking redundant connections, users shopping for reliable Internet connections with predictable response times should ask some other network design questions:

■ Do you ensure a 1-to-1 ratio of my access speed to my guaranteed backbone and network interconnection speed?

An ISP could sign up five user companies, each requiring a T-1's worth of capacity. But if that ISP's connection to an Internet backbone segment is only a T-1 — or in some cases, a 128K or even a 56K bit/sec link — there is no way each of the five users is going to realize T-1 speeds across the entire connection.

■ Do you connect directly into the Internet or do you go through other ISPs? If so, what speeds are their connections?

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SETTING THE STANDARD

## Bay Networks

*Continued from page 21*

nology from its LattisCell switches. It is unclear whether the 5000Z will emerge this year, though.

Bay is also leaving its options open on whether to develop an ATM switch for WAN access applications, similar to Cisco Systems, Inc.'s LightStream 2020 and 2080 and Cascade Communications Corp.'s Cascade 500.

"We understand [the requirements], but we can't drill down to what our plans are in that area," Collins said. "We're approaching that service provider market on a number of different levels."

Bay is also sizing up opportunities in gigabit routing, Collins said. Though he declined to discuss short-term activities on that front, Bay's solution for high-bandwidth routing is likely to be a hybrid ATM switch/IP router that can take advantage of ATM's scalability and quality of service (QoS).

"We're very much interested in developing those sorts of products," Collins said. "Five years from now, that's where the market could be."

Those products, however, will be preceded by QoS-based routing that can support multimedia applications over WAN links, Collins said. Bay will bring QoS-based routing to market this year, he said. ■

### WAN MONITOR

# The false allure of islands

This is not the column I intended to write. After hearing about CompuServe's staunch nondefense of personal liberty in response to a local German government's censorship query, I was going to take CompuServe to task by writing a column titled "Capitulation as an Art Form."

But I wonder if there is another factor at work, and if it will make much difference in the long run what CompuServe does.

Scott Bradner

CompuServe, along with Prodigy and a few others, started life as islands. They were glorified bulletin boards. Significantly glorified ones but bulletin boards nonetheless. A user would dial up to find a self-contained world.

But these islands had no connections beyond their shores. If you had an account on CompuServe and your friend had an account on Prodigy, you had to communicate by phone and paper mail rather than E-mail. And woe be to you if your friend was out there on the wild frontier known as the 'Net.

With apparent great reluctance, CompuServe, then Prodigy, started to realize that the landscape of an island is a bit limiting and that the rest of the world was out there on the Internet. First E-mail communication was enabled, then a bit of the Web. Now CompuServe is advertising the "best Internet access."

The Internet must have been kind of scary to the managers at CompuServe. First of all, who did they complain to if the Internet did not work? In addition, the Internet was starting to grow quite fast. This Web thing made the Internet user friendly and Web sites with all sorts of interesting stuff on them were springing up. If this continued, what would CompuServe use to differentiate itself from a simple Internet dial-in port?

I wonder now if the initial CompuServe reaction to the German prosecutor's questions was influenced by some residual feeling within CompuServe. Maybe they think that if they can figure out a way to go it alone and disconnect from the big, bad Internet, they will better ensure their relevance in the future.

An executive might have seized the opportunity to demonstrate so-called problems on the 'Net. This executive might have thought that if they did this often enough, the public would start reminiscing about the attractiveness and predictability of islands.

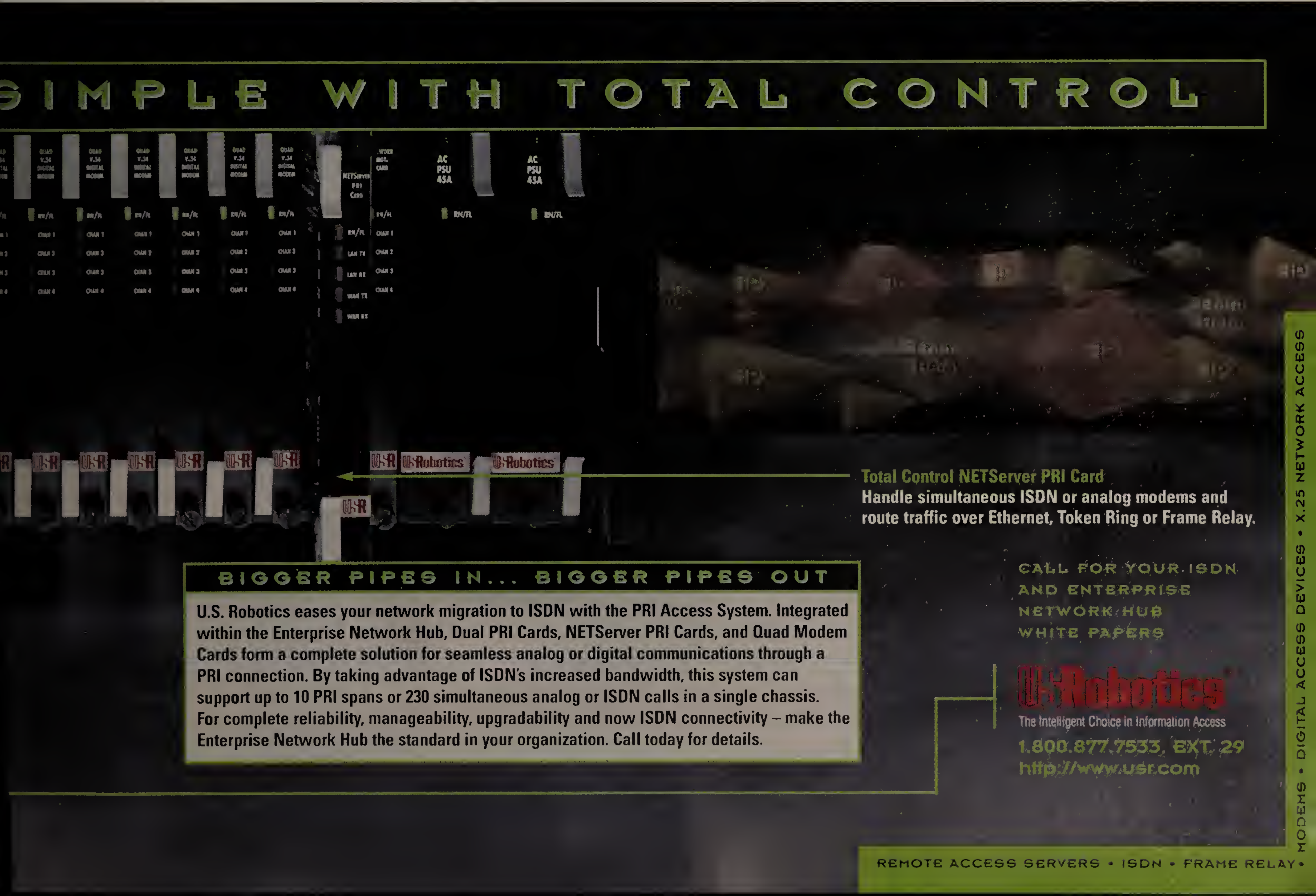
I think CompuServe and its brethren have a reason to worry. As the number of Internet-based services grow, there is less reason to use specialized access services. CompuServe, et al., will then be competing against generic Internet access services. Any special features that CompuServe has can be duplicated by organizations connecting servers to the Internet.

A feature of providing services this way — one that I'm sure CompuServe will appreciate right about now — is that the service organization does not require facilities anyplace other than where their server is. Thus, a for-fee news server in Barbados would have no property or business presence in Germany to be threatened by local authorities.

The fundamental question that CompuServe must face is not how to resist or limit the censorship demands of 179 governments around the world, but what will its role be in a future of generic data connectivity service offerings.

*Disclaimer: Harvard is not one of the 179 world governments (at least not since the Kennedy administration), and, in any case, the above are my opinions.*

*Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached at sob@harvard.edu.*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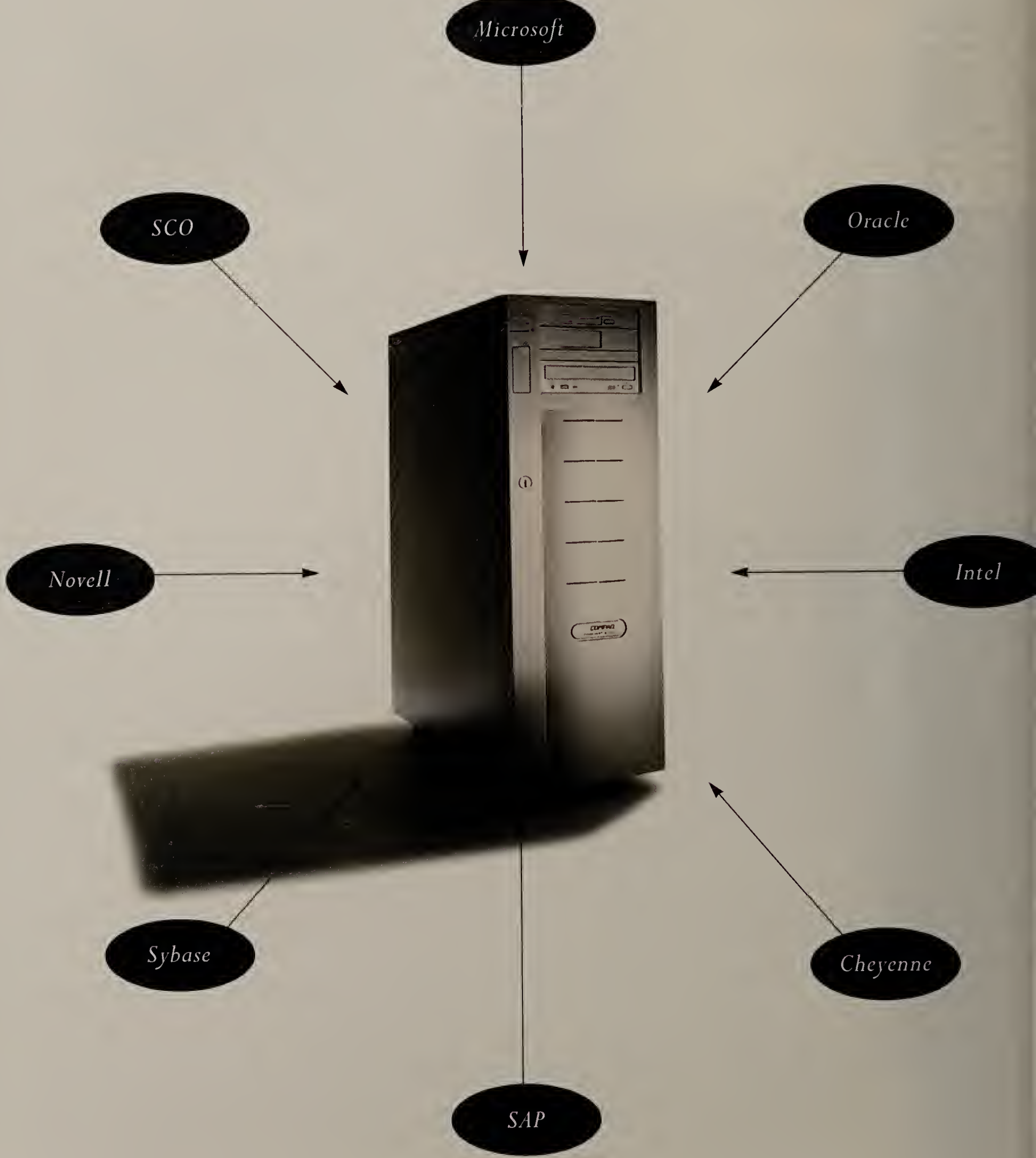

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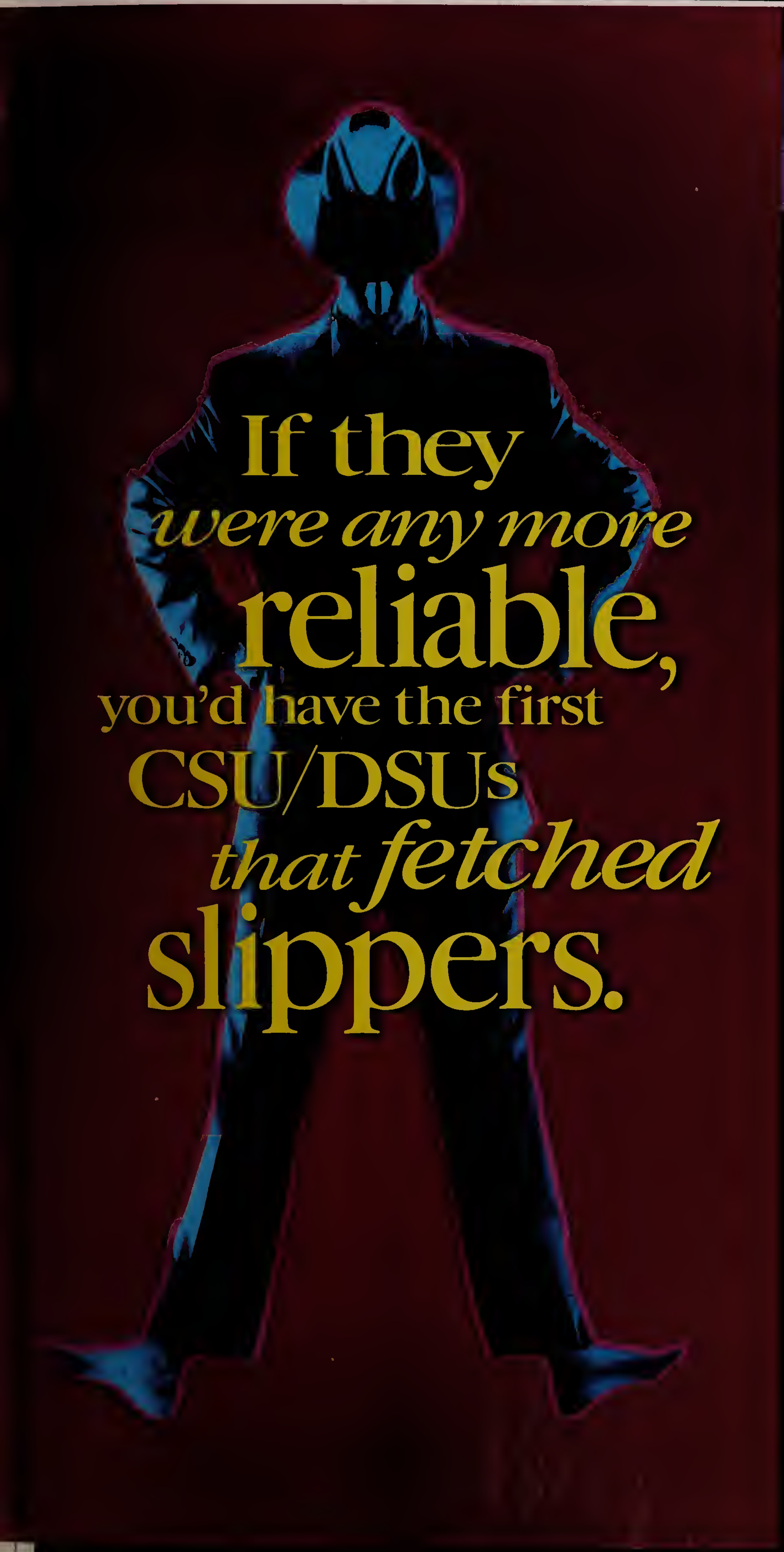

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# Local Networks

**Covering:** Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

## Briefs

■ *Token-ring equipment provider* **Nashoba Networks, Inc.,** *based in Littleton, Mass., last week announced its new* **Acton Token-Ring Media Center,** *which is designed to help users deal with the numerous interconnection variations found in token-ring cabling. The offering can serve as the cabling front end to a token-ring switch.*

*The chassis costs $300, and the Acton copper and fiber modules start at $325.*

*Nashoba: (508) 486-3200.*

■ **Preferred Systems, Inc. (PSI)** *and* **Cheyenne Software, Inc.** *last week announced plans to bundle a 45-day promotional copy of PSI's* **DS Standard NDS Manager** *with Cheyenne's ARCserve for NetWare backup product. The PSI product is a utility to manage and reconfigure the NetWare Directory Services directory in NetWare 4.X.*

*Cheyenne: (800) 243-9462; PSI: (203)-937-3000.*

■ **Symantec Corp.** *last week announced a version of* **Norton Utilities for Windows 95** *that ships on CD-ROM and includes video, animations and sound unavailable on previous versions. The multimedia content includes tutorials on Windows 95 file management, ptimizing memory configuration in Windows 95 and using Norton Utilities.*

*The CD-ROM costs $129; upgrades are priced at $69.95. The offering requires a double-speed CD-ROM drive, a 16-bit soundcard and 16M bytes of hard-disk space.*

*Symantec: (800) 441-7234.*

■ **Network Integrity, Inc.** *ast week announced a new version of its LANtegrity for NetWare* **network backup software.** *t is designed to back up LAN servers across slow WAN connections by checking data and storing only changes made since the ast backup.*

*The product costs about $4,950 for 100 users and $11,500 r 1,000 users.*

*Network Integrity: (508) 460-670.*

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Network World Fusion

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## 25M bit/sec ATM may be en vogue

**By Michael Cooney**

Vendors of 25M bit/sec ATM products have proven they can talk the talk. Now can they walk the walk?

Users will find out soon enough, given that leading network equipment makers — such as IBM, Bay Networks, Inc. and Madge Networks, Inc. — all plan to deliver 25M bit/sec Asynchronous Transfer Mode offerings this quarter.

Since its initial rejection by the ATM Forum in 1993, 25M bit/sec ATM has been a controversial subject. Some vendors wanted a 51M bit/sec specification as the low-speed ATM setting, while others maintained existing non-ATM switching technologies would be more cost-effective for linking desktops to ATM backbones.

"The 25M bit/sec ATM market still has far too many evangelists and not enough practicing mechanics," said Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "But 1996 will be the year 25M bit/sec products out-ship other ATM technologies, like 155M bit/sec adapters."

IBM could help spark interest in the market at ComNet '96, where it is expected to announce smaller, lower priced additions to its 25M bit/sec product line, including a new adapter and the 8285 workgroup switch (*NW*, Jan. 15, page 6).

"Now is the time to push low-speed ATM to the desktop in a big way," said Daniel Abensour, IBM's program director of ATM market development. "We expect to lower the total cost per seat this year so that users can begin deploying ATM in the campus."

While Abensour was not specific about how low the new IBM products would be priced, he said customers should be able to set up ATM workgroups for about $650 to $750 per seat by the end of 1996. IBM currently charges about $1,000 per seat.

Also bringing 25M bit/sec into the spotlight is Bay, which this week will announce plans to start reselling in March 25M bit/sec adapters, switches and software from First Virtual Corp.

"The 25M bit/sec solution will make the most sense to users who are looking at point-to-point video and other bandwidth intensive applications," said Jim Nielsen, market development manager for Bay's switched internetworking products. "We're looking to First Virtual to help make 25M bit/sec a practical reality this year."

First Virtual and companies such as Whitetree Technologies, Inc. were among the first vendors to have 25M bit/sec technology on the market. Madge Networks will use Whitetree's technology to make its foray into the 25M bit/sec market later this quarter.

According to Whitetree officials, 1996 will be a good year for 25M bit/sec ATM products, but 1995 was not bad. The company shipped 4,000 25M bit/sec ATM ports between Aug. 28 and Dec. 31, said Kurt Bauer, vice president of Whitetree marketing and business development.

Giving customers a clear migration path from Ethernet or token ring to ATM has helped generate 25M bit/sec ATM sales, he said. Whitetree's switch lets users migrate Ethernet segments to 25M bit/sec on a per-port basis.

The technology still has numerous hurdles to leap, however.

For example, there is the issue of what applications will drive customers to buy 25M bit/sec ATM gear. Desktop videoconferencing, an obvious candidate, is still deemed too expensive by most customers, analysts said.

LAN emulation standards also need to be completed so customers can migrate existing applications to ATM nets, said Lou Hatton, a telecommunications specialist with Pacific Gas & Electric Co. ■

### 25M bit/sec ATM backers

**Sampling of companies offering or planning to offer low-speed ATM products this year.**

- ▶ Chipcom
- ▶ First Virtual
- ▶ Fujitsu Microelectronics
- ▶ HP
- ▶ IBM
- ▶ Madge Networks
- ▶ Olicom
- ▶ Optical Data Systems
- ▶ Transwitch
- ▶ Whitetree Network Technologies

## Palindrome rounds out NT backup, storage mgmt. line

**By Ben Heskett**

*Naperville, Ill.*

Palindrome Corp., known for its NetWare backup products, this week will announce products aimed at the growing Windows NT market.

The company will introduce NT versions of its Storage Manager and Vista products. Along with its existing NT edition of Backup Director, the new offerings give Palindrome a matching set of Simple Network Management Protocol-based products for NT and NetWare.

Although the new products are intended mainly for NT environments, they also can be used to manage backup and storage procedures across NetWare LANs via tie-ins to NetWare Directory Services.

Storage Manager 4.0 for NT includes server and management console components that administrators can use to set up schedules for archiving, backups and hierarchical storage management.

The Vista 1.1 application lets companies centrally monitor and manage Palindrome's NetWare and Windows NT storage management products.

Storage Manager 4.0, available now, is priced at $1,995 for a single-server license and $3,595 for multiple servers. Vista 1.1 will be available in February and costs $1,995 for NetWare and NT consoles. The product supports up to five Backup Director or Storage Manager installations. More consoles are $795 each.

### More storage

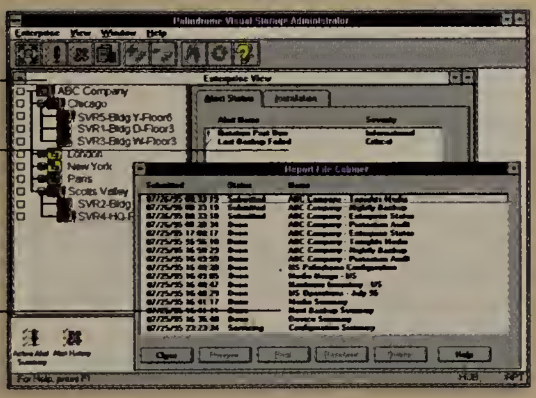
Separately, Software Partners/32, Inc. will introduce StorageCenter, a suite of storage management applications for Unix. The offerings will take the Topsfield, Mass., firm beyond its traditional Digital Equipment Corp. OpenVMS territory.

StorageCenter can perform backup functions across systems running SunSoft, Inc.'s Solaris and SunOS, Hewlett-Packard Co.'s HP-UX, IBM's AIX or Digital's Unix.

Available now, the software costs $6,250 for the enterprise version and $1,875 for the workgroup version. A personal edition will be released later this year.

©Palindrome: (800) 288-4912; Software Partners/32: (508) 887-6409.

### PALINDROME'S VISTA 1.1



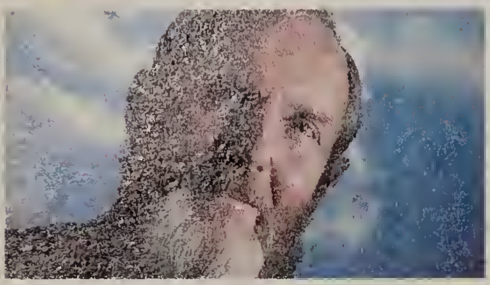
Enterprise View describes network server setup...

...and notifies administrators of problems or potential problems.

The Report File Cabinet documents the backup and storage schedule, providing status reports.

WIRED WINDOWS

Dave Kearns



# How to choose an application server

Recent stories in the trade press highlight a dangerous trend among network managers and their IS counterparts involved in choosing application servers.

We hear that Microsoft Corp.'s Windows NT Server is "easier to administer" or that Novell, Inc.'s NetWare offers "tighter security" or "higher configurability." Now, to me, an application server is the box that runs the server engine for a client/server application. Application servers include database servers, fax servers, electronic mail servers, archive servers, document servers — the list goes on.

In addition, the server may run back-end services for the net.

While the platform that the application server engine is running on should play some part in the server engine decision, I think the most important part of the equation is the application itself. In many instances, a given application engine will only run on one or another platform.

If I've decided that Microsoft's SQL Server offers all the qualities I need in a database engine, then Windows NT Server is going to be the platform, no matter how much I prefer NetWare as a network operating system (NOS). Similarly, if Novell's GroupWise offers me the best solution for E-mail and groupware, then NetWare is going to be the platform — even if Windows for Workgroups is my NOS of choice.

Does that mean I should eliminate SQL Server or GroupWise from the list of solutions I'm looking at? Of course, not. SQL Server on NT integrates into my NetWare LAN easily. The NetWare server running GroupWise will fit into the Windows for Workgroups setup with little difficulty.

On the other hand, should I decide that I need Oracle Corp.'s software as my database engine, then the choice of platform is almost limitless — there's a version for almost every operating system. Then it's time to look at Oracle's performance on various platforms — will it support the number of simultaneous sessions I need, etc.

If I'm going to need 200 simultaneous sessions supporting three call centers taking catalog orders over the phone with real-time inventory adjustments, then it really doesn't matter how much I like NetWare or NT Server — neither platform can deliver that kind of performance.

### Tip of the week

*Wired Windows is now available electronically on Network World Fusion (see page 5 for details), where you can comment on columns or ask me questions. Check it out.*

Either NetWare or NT Server, though, could be the NOS I'll use to connect end users to the platform running the database engine. And I'll choose between them based on their strong and weak points as network solutions.

I'm trying to make two points here in the hope that you'll overlook the hype coming out of Redmond and Provo.

First, there's a big difference between an application server and a NOS. Remember that today's network is a heterogeneous playing ground, with application servers running on multiple platforms all connected by your NOS of choice.

Second, choose the application first, then decide on the platform to run it. Your business managers won't want to hear about the merits of the operating system if the application doesn't fulfill their business needs.

*Kearns, a former network administrator, is a freelance writer and consultant based in Austin, Texas. He can be reached at dkearns @msn.com.*

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NET RESULTS

Skip MacAskill and Melinda Le Baron

# Don your armor for the gigabit LAN war

If the 100M bit/sec LAN war was giving you a headache, you better watch out because a colossal migraine is on the way.

Brought to you by those folks that started the 100VG-AnyLAN vs. fast Ethernet wars, we now have Gigabit VG vs. Gigabit Ethernet. Though the names are something out of an old-fashioned Godzilla movie, the effect is neither as charming nor as straightforward.

In this new battle, the bandwidth rises another magnitude. And if vendors' dreams come true, their new technology will place a reasonable doubt in the minds of companies looking to purchase Asynchronous Transfer Mode products.

To jump on our soapbox, does the industry need another technical war? Is another option to ATM really necessary?

Though it would be paranoid of us to claim that this is just another plot by vendors who either have little in the way of ATM products or expertise, we feel there are enough alternatives to ATM currently available. We'd like to see the vendors focus on giving customers quality implementations of what they are already pitching: fast Ethernet, ATM, etc.

Nevertheless, we're in no position to stop vendors from introducing Gigabit VG and Gigabit Ethernet, so we might as well figure out what they are up to.

As the standards bodies hack away at what are — or are not — the official versions of these emerging standards, it is clear that to gain this type of bandwidth increase one must dramatically decrease the length of cable that it will effectively work over.

Though the length issue is still up in the air, it appears clear that the technologies will be best suited to run within a data center rather than for connecting wiring closets to the data center.

Direct backbone connections for high-speed server farms would be an application where this technology might be appropriate. With a gigabit of bandwidth available, you wouldn't run into too many complaints about slow server access for storage and other applications.

The technologies could also meet the bandwidth needs of certain workgroups.

Of course, if the emerging gigabit technologies were used to support such applications as these, there is the question of what technology would be used to tie these islands of gigabit connectivity together without creating a bottleneck. At this point, there isn't anything.

There are obviously parallels between these gigabit LAN technologies and Fibre Channel, a high-speed networking technology that has yet to attract the masses.

Our advice for those of you looking to pump some more bandwidth into your networks is to explore existing switches, which likely will be upgraded to reach the gigabit zone in the years to come. ATM is definitely viable for backbone networks and high-speed workgroups. Then there is always FDDI switching, which provides a lot of bandwidth and is standards-based.

Whatever you do, don't get caught up in the Gigabit Wars. They should definitely not change any current plans for network upgrades or make you question your decision to upgrade to ATM.

When the standards are at least at the draft stage and the distance questions are settled, then we can start comparing the gigabit LAN products with the other offerings on the market.

*Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.*

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# Is RMON the answer for switch management?

*Yes, but it depends on how you deploy it across your LANs.*

**By Jodi Cohen**

While switched LANs offer impressive performance gains over bandwidth-strapped shared networks, most switches lack the sophisticated tools users need to monitor their networks.

Unlike a shared environment, where a net manager can attach a monitoring probe to any hub port and capture information about all of the net traffic, a switched LAN does not provide a central place to tap in and collect a sampling of all the data.

That's why top networking players 3Com Corp., Bay Networks, Inc., Cabletron Systems, Inc. and Cisco Systems, Inc. are starting to implement Remote Monitoring (RMON) capabilities in their switches (see graphic at right).

RMON technology, which can be implemented in a mix of hardware and software, is a standard for collecting data link layer statistics from LAN devices as part of an overall net management scheme.

The technology is typically implemented in agents that reside on managed devices and feed information back to a central Simple Network Management Protocol console. The Ethernet RMON standard defines nine levels, with the first four groups providing basic traffic statistics and history information.

Having RMON embedded in a switch gives net managers the ability to obtain per-port statistics that give them a view of all the traffic flying through the switch.

But not all RMON is created equal. "Users need to have a jaundiced eye out about the fact that everyone is talking about RMON," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "A lot of what some vendors are pushing with RMON is really nothing more than a few [packet] counters in the switch."

### More than packet counting

While these basic functions are part of what RMON does, McConnell said it is the higher levels of RMON — including packet capturing and filtering functions — that are needed for sophisticated troubleshooting. Many customers prefer embedding RMON in their switches because it lets them monitor the devices remotely.

But embedding all of the RMON functions, as Cabletron offers on its Ethernet switches, could overload the device to the point that it would affect the device's core switching abilities, analysts said. Having a built-in probe is convenient for the net manager, who can remotely control the device from a central location.

Because internal probes take the device's processing power to do monitoring and could negatively affect the switch's performance, users may want to consider external probes.

External probes, which physically attach to the outside of a switch port, work in conjunction with a switch's port-mirroring functionality, said Tom Bain, a research analyst at META Group, Inc., a consultancy in Reston, Va.

Net managers can attach an external probe on one of the switch ports and direct streams of traffic to that particular port for analysis, he said.

## RMON REQUIREMENTS

**With all the major switch players talking about RMON, here are some important questions to ask vendors before settling on a switch.**

- ▶ **Are** all nine RMON groups supported?
- ▶ **How** many packets/sec can the RMON agent handle without negatively affecting switch performance?
- ▶ **Can** switch traffic be steered to a remote site to off-load traffic analysis?
- ▶ **Does** the RMON implementation include an agent to rove switch ports, monitoring only those ports suspected of causing problems?
- ▶ **Does** the device offer sampling capabilities, such as the ability to monitor one out of every 200 packets?

SOURCE: McCONNELL CONSULTING, INC., BOULDER, COLO.

Portable probes are especially good for high-speed switches — such as those supporting fast Ethernet or FDDI, McConnell said. "Right now, you can't put enough [processing power] inside the switch to keep pace with the management [needs]," he said.

But analysts cautioned that external probes may require a net manager to walk across the campus to hook up the probe, a time-consuming task that could delay diagnosis of the network problem. Companies such as Axon Corp., Fluke Corp., Frontier Software Development, Inc. and Network General Corp. are among the vendors making external RMON probes.

## Armed with RMON

**The top internetworking equipment players each plan to integrate Remote Monitoring capabilities into their LAN switches.**

| Equipment vendor/RMON partner | RMON strategy |
|---|---|
| 3Com/Axon | 3Com will offer a distributed approach that includes extending a variety of RMON-like SmartAgents to workgroup and backbone switches. 3Com also has rolled out the RMON Client Application for its Transcend network management system, which allows customers to gather statistics collected by RMON agents on 3Com gear. |
| Bay Networks/Armon Networking | Bay plans to embed internally-developed RMON and RMON2 agents in most of its switching devices, including its token-ring SpeedSwitch. Bay also has announced management tools that provide packet capture, as well as real-time and historic data about LAN segments. |
| Cabletron/None | Supports all nine RMON groups on its Ethernet SmartSwitch module for the MMAC and MMAC-Plus hubs. Also supports per-port RMON for its MicroMMAC hub. The company plans to announce RMON support for new token-ring switching modules later this month. Cabletron's Spectrum net management application presents RMON statistics via special screens that display different MIB groups. |
| Cisco/Frontier Software Development | Cisco will add RMON and RMON2-like agents to its Catalyst 5000 multimedia and 1600 token ring switches. The Catalyst 1200 Ethernet and FDDI switch already has embedded RMON. Cisco also plans to resell Frontier's NetScout probes – under the name SwitchProbe – for monitoring fast Ethernet, FDDI, token-ring and Ethernet links. |

### Take a sampling

Another way to avoid taking a big performance hit with embedded RMON is to look for a switch that offers sampling capabilities. Sampling allows a net manager to catch only a specified percentage of all packets and then do simple profiles on traffic loads. Although standard RMON does not currently do sampling, analysts said they expect that to change.

Hewlett-Packard Co. is one of a handful of vendors that provides sampling with its EASE net management tool. Analysts expect others to follow soon.

Another feature that would help reduce the impact of RMON on the switch's processing power is the ability to steer traffic to a remote site. This feature allows a net manager to send data to a remote monitoring center so as not to negatively affect the switch's processing power. But not all types of switches support this option.

For example, this approach will not work for users with store-and-forward switches because these devices throw away all bad packets.

Customers also can look for a switch with a roving agent to help prevent RMON processing from having a big impact on switch performance. Instead of getting per-port RMON statistics, some switches will allow a net manager to assign an embedded probe via remote control to different ports in the switch.

This allows a net manager to move the RMON agent to a particular switch port suspected of having problems and then monitor it without bogging down the switch.

### Distributed monitoring

RMON capabilities can also be distributed across multiple switches to match the amount of management needed to the switch involved. Under such a scheme, each switch would support a different number of RMON groups depending on where it resides in the network.

3Com, among others, is enabling customers to implement RMON in this fashion. The company claims that it should be more effective since not every switch will need to support all types of RMON capabilities.

Certain RMON functions, such as packet filtering or packet capturing, might make most sense in a workgroup switch, which sits close to the source or destination of the packet. At the backbone, users would probably benefit most from RMON technology based on very high-speed silicon that can keep overall traffic statistics.

The key to this distributed approach is the development of integrated management tools that can combine the information from the workgroup switch with that of the backbone switch, McConnell said.

While many vendors are exploring ways to do less monitoring per switch, at least one company — Madge Networks, Inc. — is looking to beef up its switch's management processing power, META Group's Bain said.

The Madge approach involves having an agent with enough processing horsepower on the switch so that it can monitor traffic traversing a multigigabit backplane, he said.

But many of these key monitoring tools are not yet available, limiting net managers' visibility and understanding of their switched networks.

"You can't really manage, control or optimize a complicated network if you don't have the information about its behavior," McConnell said. ■

# Client/Server Applications

**Covering:** Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

## Briefs

*Database maker* **Sybase, Inc.** *will announce a technology alliance this week with* **Persistence Software, Inc.,** *which sells middleware for accessing corporate databases from object-oriented front-end applications. The companies will work together to develop software for accessing Sybase databases from C++ applications.*

*Level Five Research, a division of* **Information Builders, Inc.,** *last week announced* **Level5 Quest Web Server,** *a data query and analysis engine for the World-Wide Web. The software uses fuzzy logic and ranks the results of a search according to user-defined preferences. The software will ship in March. Pricing was not available.*

*Level Five: (212) 736-4433.*

**Wang Laboratories, Inc.** *and* **Microsoft Corp.** *last week announced the release of* **imaging software** *developed by Wang for Windows 95. The software lets users scan, view, annotate, manage, store and share faxes, paper documents and electronic images. The software is available over the Internet (http://www.microsoft.com/windows and http://www.wang.com) and on-line services.*

*Wang: (508) 967-3000.*

**Oracle Corp.** *has begun shipping the Oracle Transparent Gateway for Express,* **middleware** *for accessing data stored in the multidimensional Oracle Express Server database using any standard SQL front-end tool. Pricing was not available.*

*Oracle: (415) 506-7000.*

**Tivoli Systems, Inc.** *has begun shipping Tivoli AMS Module, a set of* **management objects** *for managing SAP AG R/3 client/server applications using Tivoli's Management Environment. The software is priced from $50,000 to $200,000.*

*Tivoli: (512) 794-9070.*

## Hitachi speeds query processing across nets

**By John Cox**
*Montreal*

Beta testing has begun on a new database technology from Hitachi Data Systems (HDS) that could dramatically change the price/performance of querying vast amounts information stored in data warehouses.

HDS Nucleus Server is an SQL relational database that uses a technology called bit vectors to speed up the processing of open-ended questions typical of large-scale decision support systems. Because the work is done through software, it eliminates the need for customers to invest in expensive parallel processing machines just to speed queries.

Bit vector technology, in effect, creates a shorthand version of a conventional, record-oriented database. The shorthand version is a collection of 1s and 0s that can be processed more efficiently by a computer than sequential records in a database.

A side benefit is that Nucleus Server, which runs on Digital Equipment Corp.'s 64-bit Alpha computers and Unix operating system, can store its information on far fewer disks than needed by traditional relational databases. It will be available later this year for the Power PC and IBM's SP2 parallel computer.

One user working with an alpha release that ran on a special PC board found big improvements in query processing during early benchmarks.

Marketing analysts at Canadian Tire Acceptance (CTA), Ltd., a Welland, Ontario, credit card arm of an automotive retail chain, typically batch complex queries overnight to a 40G-byte data warehouse based on a parallel computer from the former Terradata Corp. Each morning, they take the results and run them through various analysis applications to make marketing decisions, said Jackie LaFontaine, a data technology analyst with CTA.

These are complex queries working a million database rows at a time and joining lots of data from multiple tables. To test Nucleus Server, CTA ran 13 queries on a prototype server in less than an hour. The same queries took 7 to 8 hours on the parallel computer, LaFontaine said.

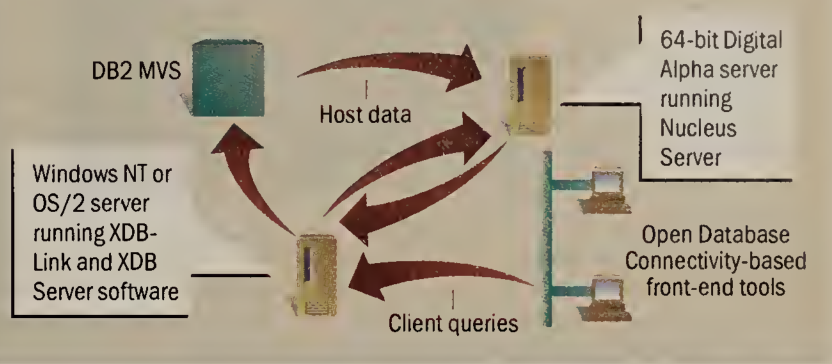
"There isn't going to be a big learning curve [with Nucleus Server], especially from a database administrator's perspective," she said. "The main issue is moving data from flat files into the Nucleus engine. And that doesn't seem to be a big deal."

Last month, HDS announced a marketing and support deal with XDB Systems, Inc. of Laurel, Md., to let HDS remarket XDB's DB2-compatible servers, and communications and client querying tools with Nucleus Server.

The package, scheduled to be available April 1, will give MIS groups a solution for moving data from existing corporate DB2 databases into Nucleus Server. It will also let end users with PCs run complex queries that otherwise would bring mainframes to a grinding halt.

### HDS'S NUCLEUS REACTION TO DATA WAREHOUSING

Nucleus Server is at the center of HDS's data warehouse offering. The server is based on bit vector technology, which enables it to process complex, ad hoc queries much faster than conventional databases. The software comes packaged with XDB's DB2-compatible database and XDB-Link middleware, which provide end users with access to the data warehouse and the data warehouse with access to back-end databases.


DB2 MVS
Host data
64-bit Digital Alpha server running Nucleus Server
Windows NT or OS/2 server running XDB-Link and XDB Server software
Open Database Connectivity-based front-end tools
Client queries

Don DePalm, a senior analyst with Forrester Research, Inc. in Cambridge, Mass., said HDS will have to show convincing price/performance metrics to persuade users to go with HDS rather than wait for their traditional database vendors to supply it. He said users should explore how effectively Nucleus Server can be managed and maintained as a separate database from the source data store.

Pricing for Nucleus Server is expected to range from $50,000 to $250,000, depending on database size. The total price of a typical 50G-byte database configuration, including Digital hardware, would probably be in the $300,000 to $400,000 range, according to HDS officials.

© HDS: (514) 982-0707.

## Oracle readies 'Lite' database

**By Barb Cole**
*Redwood Shores, Calif.*

Oracle Corp. next week will announce a low-cost, low-overhead database designed for extending distributed Oracle databases out to end users

*See* Lite, *page 35*

### RealityCheck

**Product**
Personal Oracle Lite

**Company**
Oracle

**The benefits**
- ▲ Requires less than 1M byte of RAM.
- ▲ Is an object-relational hybrid that will be compatible with Oracle8.

**The drawbacks**
- ▼ Lacks replication tools.
- ▼ Existing Oracle applications may not run against it.

**The user view**

*"Right now, we're using [Sybase] SQL Anywhere in the field and running Oracle servers. It would be nice to have the same database on our mobile clients and servers."*
**Kevin O'Brien, BSG**

## Third-party vendors spill Notes offerings

**By Carol Sliwa**
*Orlando*

While Mickey Mouse and Goofy keep the kiddies occupied, Lotus Development Corp.'s business partners will keep the adults entertained with more than 150 new or enhanced products at the company's sold-out customer conference here this week.

The wide-ranging list of third-party announcements to be made at Lotusphere '96 — in conjunction with the official Notes 4.0 launch — includes everything from a visual programming tool with native 32-bit support for Windows 95 and Windows NT to a label maker.

Revelation Software of Stamford, Conn., plans to unveil ViP 2.0 for Lotus Notes, a programming tool to extend the Notes environment with viewer-friendly, 32-bit applications that run on Windows 3.1, Windows 95 and Windows NT machines.

James Acquaviva, Revelation's president and chief executive officer, described the product as "visual LotusScript."

Applications created on Windows 95 or NT 3.51 machines will work with both Notes 4.0 and 3.X, and support Microsoft Corp.'s OLE 2.0.

*See* Lotus, *page 35*

NetworkWorld Fusion
**Read articles on the new features of Notes 4.0. Select News+ then Client/Server Applications.**

SHARED LOGIC

# All groupware roads lead to Orlando

Thousands of groupware junkies this week will descend on Orlando to attend Lotus Development Corp.'s annual Lotusphere shindig, and all I keep thinking is: What a difference a year makes.

Who would have thought the inimitable Mike Zisman and, of all people, IBM's Lou Gerstner, would be keynoting this year's festivities? Gone are Lotus staples like Jim Manzi's plodding speeches and John Landry hanging from the ceiling like Spiderman. Who knows, maybe Big Lou and Dr. Z will surprise us and don Batsuits. Their mission, after all, is to save Gotham from the clutches of the evil Mr. Bill.

**Mike Rothman**

All kidding aside, IBM/Lotus this week will fire the first cannon in its inevitable showdown with Microsoft. With the "official" unveiling of Notes Release 4, IBM's application vehicle to return to networking software prominence, Lotus is gaining a clear advantage in both the messaging and groupware markets.

Release 4 changes everything for Lotus. There's a lot of new stuff in the package, including additional scalability, better development tools, enhanced manageability . . . I could go on for days. But that's not the point. Users now have a compelling platform to build truly enterprise and even inter-enterprise collaborative/messaging applications. That's something all my clients have needed for years. It puts Microsoft Corp. and Novell, Inc. behind the eight ball. Both need to ship a stable, robust platform soon — like, within a quarter.

My best guess says Microsoft delivers and Novell doesn't. June is more likely for Novell's GroupWise XTD release.

Regular readers of my column know I believe Microsoft Exchange will be a good mail package, but collaborative functionality will lag for a while. Frankly, Microsoft has done a pretty good job of positioning Exchange with that in mind. I've heard Microsoft marketing folks make the following pitch: "Hey, Mr./Ms. Big Corporate User, why do you want messaging and collaboration tools in one box?"

They are right; many folks don't want it all in one box. That's why the Lotus mail bundle is so key for Lotus as it puts Notes within the reach of the common customer. Lotus is going to hit a colossal home run with Release 4. Many of the shortcomings of previous versions have been addressed and the migration path has been well thought out, giving both cc:Mail and Notes Release 3 shops clean paths to Release 4.

The most notable missing piece is clearly Lotus CommServer, set for a summer release. For those of you looking to migrate to Version 4 in the first half of this year, this is a big deal. You're stuck using the old Lotus Message Exchange Facility to go from cc:Mail to Notes.

This isn't a deal-breaker, but it probably delays large-scale migrations until the third quarter. Spend the time planning, piloting and enhancing Release 3 applications to take advantage of Release 4 features, such as Navigators.

So those of you not in Orlando this week are missing out — not just on the opportunity to see Mickey Mouse, but the chance to see the future of collaboration.

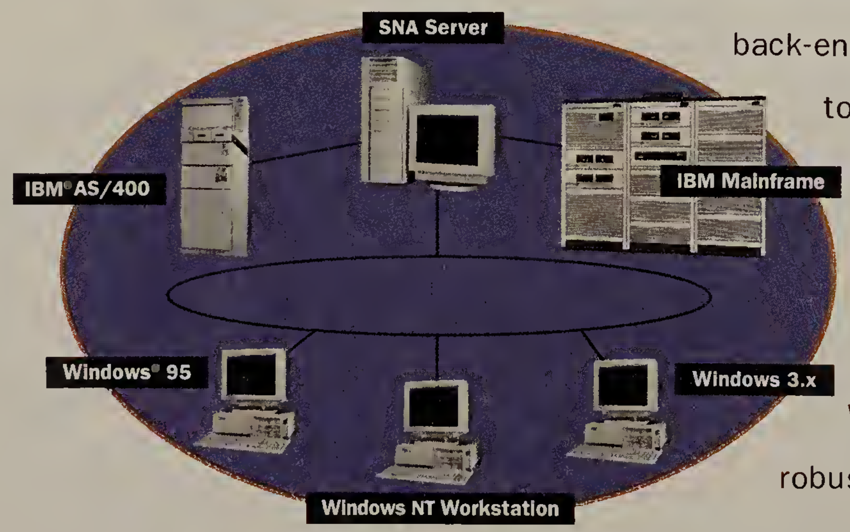
*Rothman is a vice president in META Group's Global Networking Strategies service in Reston, Va. E-mail him at MikeR@metagroup.com or call at (703) 860-6600.*

## BusinessBriefs

Los Gatos, Calif.-based **Red Brick Systems, Inc.** will go public this week. The company, founded in 1986, sells the Red Brick Warehouse database, which is used to deploy sales and marketing data warehousing applications. The company was profitable for the first time in 1995, with earnings of about $400,000.

**Platinum Technology, Inc.** continued its buying spree last week with the purchase of Edin Prairie, Minn.-based **Prodea Software Corp.** for about $36 million.

Prodea sells software for adding on-line analytical processing capabilities to relational databases.



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## Lite

*Continued from page 33*

equipped with portable computers.

The $199 Personal Oracle Lite package features several ways to tie it into existing networked Oracle database environments. For one, database administrators will be able to update remote database applications via the Oracle Software Manager, a graphical user interface-based tool for managing Oracle databases from a central site.

Also, in its second release later this year, Personal Oracle Lite will be able to replicate data to the workgroup and enterprise editions of Oracle's database.

Developers will be able to build mobile applications for Personal Oracle Lite using the company's Developer 2000 and Mobile Agents development tools, as well as any Open Database Connectivity-compliant front-end tool.

The single-user database requires only 1M byte of RAM and about 10M bytes of disk space, according to Denise Lahey, an Oracle product manager. It is positioned against Sybase, Inc.'s SQL Anywhere and Centura Software Corp.'s SQLBase small-footprint databases, among others.

The rollout of Personal Oracle Lite comes about a year after the introduction of Personal Oracle7, a scaled-down version of the company's flagship database. The knock against Personal Oracle7 is that it requires such significant hardware horsepower that it is typically impractical for mass deployment.

Personal Oracle Lite will be an object/relational hybrid that supports the same object data types as the company's upcoming Oracle8 server upgrade, Lahey said. As a result, developers will have an easier time moving mobile applications into the enterprise. The lightweight database will not necessarily be compatible with existing Oracle applications, however, because it does not support PL/SQL, the SQL dialect used in the enterprise edition.

Despite its limitations, customers said Personal Oracle Lite would be a useful addition to the company's database offerings. "There are instances when you want to do quick-and-dirty prototypes and you don't have a server available," said Kevin O'Brien, a consultant at BSG Corp. in Houston.

Personal Oracle Lite will ship this month on Windows. Versions for the Macintosh and PowerMac will ship in March. A version for Oracle's Network Computer is scheduled for July.

© Oracle: (415) 506-7000.

## Lotus

*Continued from page 33*

ViP 2.0 for Lotus Notes will be available Feb. 29. For a limited time, commencing at Lotusphere, Revelation is offering a special introductory price of $995 per developer and $249 for Version 1.1 upgrades. After that, it will cost $1,695 per developer, with upgrades available for $399.

Also at the show:

■ Pleasonton, Calif.-based Documentum, Inc. will announce Documentum Link for Lotus Notes, software for accessing its document management server from Notes clients.

The Documentum server tracks text, images, graphics and workflow objects. The software will ship in April, and pricing will vary based on the number of end-users supported.

■ Percussion Software, Inc., of Stoneham, Mass., will launch Notrix Composer 3.1, a tool for linking Notes databases with relational databases. The new version promises speedier performance, a visual interface to make data integration easier to perform and bidirectional data replication capabilities.

The base package, priced at $3,750, will be available next month.

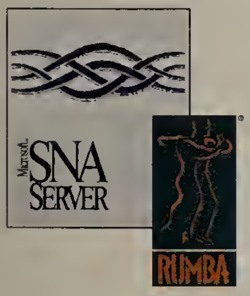
■ Colorado Springs-based Emerging Technology Solutions, Inc. will release Business in a Box for Notes Release 4, a suite of 20 predesigned applications for Notes networks.

The applications, which is designed for small and midsize businesses, focus on sales and marketing, human resources, cost and asset tracking, and office administration. The suite is available for $3,995 per server.

■ Cambridge Software Group, Inc., of Cambridge, Mass., plans a series of announcements at Lotusphere. Formula Editor 2.0, a software add-on that enhances the programming environment for Notes, will now support multiple edit fields, keystroke macros and formula debugging. Formula Editor is priced at $149.95 for a single user and $39.95 for upgrades.

In addition, the company will offer a product called Label Maker to enable users to print labels from their Notes databases. The product comes packaged with CoStar Corp.'s LabelWriter XL for 1-inch labels at $249.95 or the company's LabelWriter XL Plus for 2-inch labels at $299.95.

© Revelation: (800) 262-4747; Documentum: (510) 463-6800; Percussion: (800) 283-0800; Emerging Technology Solutions: (719) 590-4827; Cambridge Software Group: (800) 792-7248.



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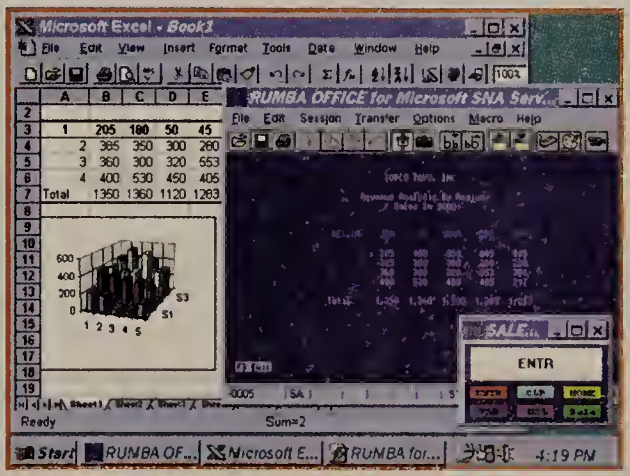
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| | A | B | C | D | E |
|---|---|---|---|---|---|
| 2 | | | | | |
| 3 | 1 | 205 | 180 | 50 | 45 |
| 4 | 2 | 385 | 350 | 300 | 280 |
| 5 | 3 | 360 | 300 | 320 | 553 |
| 6 | 4 | 400 | 530 | 450 | 405 |
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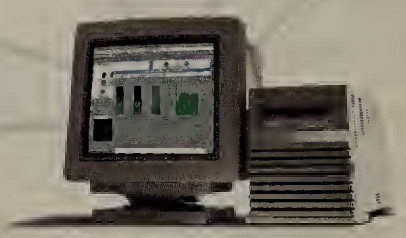

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# Electronic Commerce

**Covering:** Tools and Techniques for Interenterprise Networking and Doing Business On-Line

## Briefs

■ **Northern Telecom, Inc.'s** *Secure Networks division last week began shipping Entrust 2.0, an update to its* **encryption software** *tool kit, which now includes a cross-certification feature that lets firms approve public-key certificates issued by other authorities.*

*Nortel: (613) 765-5607.*

■ *A survey of 20 companies released last week reveals* **the cost of building a commerce-ready Web site** *ranges from $300,000 to more than $15 million. The survey, conducted by market research firm* **International Data Corp. (IDC),** *found costs are often running more than four times higher than expected.*

*IDC: (508) 872-8200.*

■ **Internet Security Systems, Inc.** *has released Internet Scanner 3.2, the latest version of its* **net attack simulator** *for probing corporate security holes that can be exploited by 'Net hackers. It tests for security holes in Windows NT and Windows 95.*

*Internet Security Systems: (770) 441-2531.*

■ **The ForeFront Group., Inc.** *has released WebWacker 1.0 for Windows 3.1. The software lets users download Web pages and store them to a local drive, linking pages exactly as they were on the 'Net. WebWacker, priced at $49.95, is intended as an* **alternative to extended browsing on-line**.

*ForeFront: (800) 867-1101.*

■ **Training and technical support** *programs for* **Java and the 'Net** *— in the classroom, on-line and with several partner vendors — are being unveiled this month by SunService, a division of Sun Microsystems, Inc. in Milpitas, Calif. SunService's Sun Vendor Integration Program gives users single-call SunService support for Sun products and participating software developers, including Oracle Corp. and Sybase, Inc.*

*Sun Educational Services information is available at http://www.sun.com/sunservice, or call (800) 786-7638.*

## Microsoft ware anchors on-line mall

**By Peggy Watt**
*Seattle*

Just as shopping centers court large department stores to "anchor" a mall, on-line shopping services seek the same sort of heavy hitter to lure customers.

At the launch of atOnce Software this month, Microsoft Corp. played the anchor with a pilot program reselling its software on-line. The service, managed by Online Interactive, Inc., lets on-line customers download Microsoft applications.

**Jump to Network World Fusion and compare different approaches to securing on-line transactions. Select News+ then Electronic Commerce.**

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http://www.nwfusion.com

Most on-line software shops let customers download only small applications that won't tie up a modem for hours, or take orders on-line but ship products by more conventional means, noted John Ballantine, executive vice president of Online Interactive. Microsoft, however, wanted a dual-path architecture, which calls for separate routes for downloading applications and making payment.

To make application downloading feasible and secure, Online Interactive paired with Portland, Ore.-based Portland Software, Inc., which developed a dramatic file compression and encryption technology called ZipLock.

Downloading the entire 80M-byte Microsoft Office suite with ZipLock takes about 10 minutes on a T-1 line, said Chuck Jennings, Portland Software's president and chief executive officer.

Paying and decrypting software encrypted with ZipLock is handled not over the Internet, but via a direct line to credit card verification service LitleNet Network, Inc., based in Salem, N.H. As part of the software installation process, the customer enters a credit card number and ZipLock places a toll-free call directly to LitleNet to verify the customer's credit, just like the authentication service to which many merchants subscribe. If all checks out, LitleNet returns a decryption key to unlock the user's new software.

"Because the decryption is over a separate route, nobody is involved but the authorization service and the customer," Jennings said.

Online Interactive also sells 450 software titles on The Microsoft Network (MSN) and manages a mail-order store with some 6,000 products on America Online. The service is scheduled for launch on CompuServe in the spring.

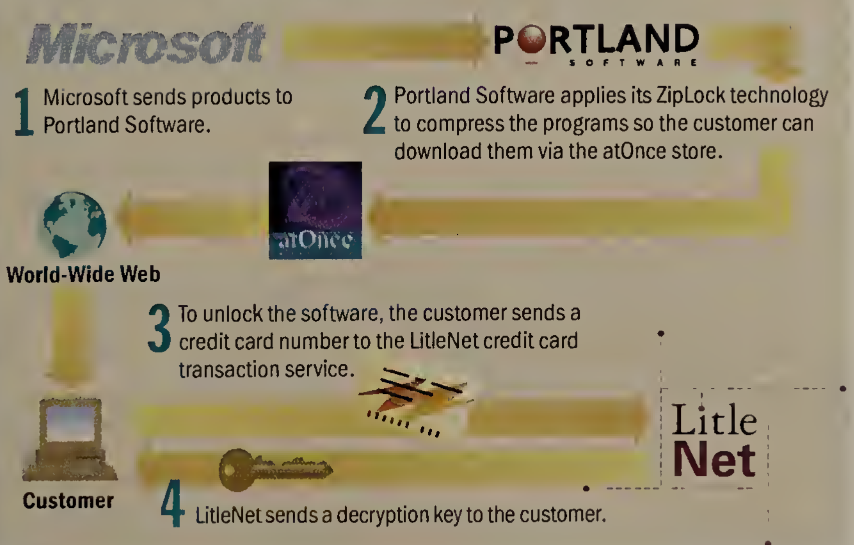
"We're all figuring out how electronic distribution can work effectively for the customer and the reseller," Ballantine said. The challenge is making on-line shopping compelling enough to interest customers, he added.

But as bandwidth increases, on-line shopping and, especially, downloading software will become more enticing, he said.

Microsoft's other pilot programs include another on-line software shop on MSN managed by Online Interactive, and participation in Software.Net, launched last June by CyberSource Corp. of Menlo Park, Calif. CyberSource processes credit cards over the Internet using CheckFree Corp.'s secure payment services.

The atOnce Software stores can be found on the 'Net at http://www.portsoft.com/atonce. ■

THE WINDING ROAD OF COMMERCE



1 Microsoft sends products to Portland Software.

2 Portland Software applies its ZipLock technology to compress the programs so the customer can download them via the atOnce store.

3 To unlock the software, the customer sends a credit card number to the LitleNet credit card transaction service.

4 LitleNet sends a decryption key to the customer.

BUSINESS SPACE

## Rotten image from Johnny

I recently saw *Johnny Mnemonic*, the sci-fi film adapted from a story by the man who created the cyberpunk subgenre, William Gibson. I know it's been out for months, but I've been busy.

I also rented *Pulp Fiction* (which was wonderful). After we watched John Travolta put in a fine performance, my wife, who likes science fiction less than oral surgery without anesthetic, said, "You're on your own," and disappeared. I settled down with great expectations (Wouldn't that be a great title for a book?), and . . .

My first question concerns Keanu Reeves, who plays the lead character. Where did they find a block of wood that big? He was *so* bad it was embarrassing. Who told him he could act? Must have been the same idiot who told Pia Zadora she could sing.

**Mark Gibbs**

The sets were cheesy (like Ridley Scott on a tight budget — a very tight budget) and the pacing was awful. The acting and dialogue were, by turns, turgid then overly excited. It was wretched.

To misquote Dorothy Parker: "This is not a video to be casually tossed aside — it should be hurled with great force."

"So what is Gibbs point?" you may well be asking yourself. "After all, *Network World* doesn't pay him vast sums of money to review films; they pay him a pittance to write about electronic commerce."

The point, gentle reader, is this: It is this kind of junk that helps define how the world thinks of computers and their future.

The problem is that people, in general, don't understand computers. This kind of nonsense paints a layer of mystique and threat that reinforces the image of the computer world as being unfathomable and dangerous. I don't mean that it matters that people don't know how computers work; that's not the problem. Many people don't know how their cars work, yet they still drive.

I mean people don't understand what computers can, and cannot, do. They generally have little or no insight into the implications of computers and an acquired fear and distrust of the technology.

For those of us who know that an electronic world is the future of business and indeed, of culture, it is vitally important that we become vocal critics of the trash that is written, filmed and broadcast about the Internet and computers in general.

We need to make our users and business partners understand that the electronic commerce-based world of the future — the highly wired, richly connected, data- and information-rich world — can be understood and will be of human scale.

Fear and misunderstanding of computers — their uses and potential — and the 'Net play straight into the hands of self-promoting politicians. (Good-old Sen. Exon comes to mind.)

So if you can see the digital writing on the virtual wall, become an outspoken advocate of computer technology. Don't allow the ignorant and ill-informed to perceive computers and communications as a threat or danger. The stakes are too high.

*Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or via the Internet at mgibbs@gibbs.com.*

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# Technology Update

Keeping Up with Network Technologies and Standards

## NETWORK HELP DESK

Network World *tracks down answers to your questions. Please submit them to Jim Brown via phone at (800) 622-1108, via the Internet at jbrown@nww.com or via fax at (508) 820-1103.*

**After replacing NetWare NETX drivers with Virtual Loadable Modules (VLM) on my workstation, I can no longer navigate directories from the DOS prompt of a network drive, nor use the shortcut "double dot" command to jump back a directory level. In addition, the Purge/All command now only affects the current directory. What's the problem?**

**Via the Internet**

Check the LASTDRIVE statement in the workstation's config.sys file. This statement tells the VLM what the last drive letter should be, says Alan Downs, an Associate Computer Professional and Certified Novell Engineer at ValCom More Than Computers, Inc. in Middleton, Wis. You also want to make sure you are using DOS Version 5.0 or later.

If that doesn't work, try printing out the netcfg.txt file, which you'll find in your NetWare Client Kit. It is a gold mine of information about how to configure the net.cfg (previously shell.cfg) and will tell you which VLMs are optional.

Rename all the optional VLMs for testing and include the MESSAGE LEVEL=3 (or 4) parameter in the net.cfg file to help you determine which portion is not working properly. In addition, remove all other TSRs and devices.

If the problem persists, the VLMs may be corrupt. Download VLMUP3 from either Novell's CompuServe Forum or its Web site at http://netwire.novell.com/FileUpdt/ and compare this to your files.

As another check, make sure the server's network cards, drivers and related modules are current. You can also load the latest Novell patches — LANDR4, LIBUP5, LOG376, MAP312 and 312PT6. You might want to start with 312PT6 because it requires the server to be taken down to load some of the VLMs from the startup.ncf file. Then install the others.

Incidentally, the LIBUP5 patch has an install routine that checks to see if it needs to be installed, asks permission, and does all flagging and installing.

# Replication using messaging systems

**By Eldon Greenwood**

With Novell, Inc.'s GroupWise XTD and Microsoft Corp.'s Exchange products due out shortly, replication services will soon arrive in the corporate electronic messaging infrastructure.

Once there, companies will gain considerable flexibility in how they develop applications. They will be able to coordinate replication with other services — calendaring, scheduling, conferencing and document management, for example — already provided via the messaging infrastructure.

With replication services in general, applications that use structured or loosely structured data can be distributed across the network rather than maintained in a central repository that users have to individually access. Replication services already have been implemented for structured data in many database systems, such as Lotus Development Corp.'s Notes groupware.

In database-structured systems, changes made to any copy of the database are replicated to all other copies. The replication service maintains the integrity and consistency of the distributed database as if it were centrally stored and accessed.

Whether database- or message-based, any system that provides replication services must let the user, administrator or application developer specify the location of replicas, the frequency with which replication occurs, connection information between the replicas and filtering capabilities.

### By the clock

Notes, for example, uses a model that calls for periodic, scheduled replication.

During that interval, Notes servers must be able to connect to each other and exchange updates.

With the message-based schemes due in GroupWise and Exchange, database changes are replicated immediately across the network through store-and-forward message transfer agents (MTA).

When working with a scheduled system, developers and administrators must consider several factors when determining the frequency of replication.

For example, a database that is replicated infrequently will have a greater likelihood of collisions, which occur when the same record is modified on more than one copy of the database. (Resolution generally requires administrator intervention.) Replications can be slotted more frequently at the cost of driving up network overhead.

What's more, databases that are replicated infrequently may contain outdated data. If replication only occurs every eight hours, for example, then a database may not contain information entered on another copy of that database for up to eight hours.

Cumulative latency in database information can be reduced by configuring replication servers to communicate directly. But that's not efficient in server-heavy WAN environments.

Replication overhead can be reduced by linking the servers in a hub configuration, but establishing a configuration that keeps latency low can be difficult. Developers also have to consider filtering capabilities, which are especially important when implementing server-to-client replication.

Filtering could allow the replicated store to request only those items that were created before or after a specific date or by a certain user, that deal with a certain client, or that contain data referencing a particular subject, for example.

More commonly, filters are used to get only the changes since the last replication. This would come in handy, for example, when a user at an airport wants to download updates before catching a flight.

Filtering would limit the replication to new items of selected types, and limit the size of replicas.

### Ready, set, go

Since database changes are replicated immediately through MTAs, most of the factors that influence application development in a scheduled replication system are irrelevant with message-based replication.

Because the changes happen immediately, the probability of collision is low. Little overhead is required to use the MTA for replication.

Replicas are distributed in near real time so latency is minimal. And direct connections between servers are not needed since the messaging infrastructure is used to provide routing services for replication.

Messaged-based replication also is more tolerant than scheduled replication when servers are not available for updates. If a server cannot be reached, the replication messages will simply be queued until that device is brought back on-line. The rest of the system will not be impacted by any server's absence.

The availability of messaging-based replication through GroupWise and Exchange will bring the technology into a new realm in that it will become available to developers working with applications that are not database-structured.

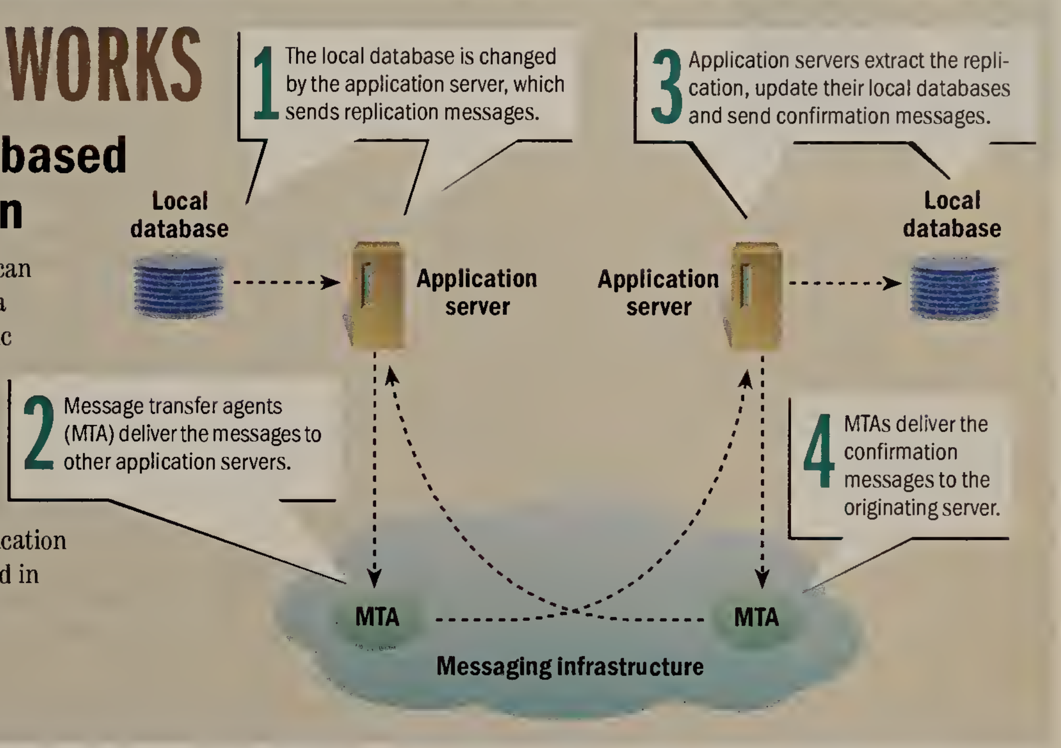
A law firm, for example, might want to use replication capabilities for a docketing application that notifies lawyers what steps they need to take after a court date is set. This application would need to work in conjunction with a calendaring service offered via the electronic messaging infrastructure. This type of application could not leverage replication provided over a database system.

*Greenwood is director of product management for Novell's GroupWare Division in Orem, Utah. He can be reached at (801) 226-6000.*

## HOW IT WORKS

### Message-based replication

Database changes can be replicated over a corporate electronic messaging infrastructure to application servers in near real time. This differs from the scheduled replication model typically used in database systems.



1 The local database is changed by the application server, which sends replication messages.

2 Message transfer agents (MTA) deliver the messages to other application servers.

3 Application servers extract the replication, update their local databases and send confirmation messages.

4 MTAs deliver the confirmation messages to the originating server.

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EDITORIAL INSIGHTS

## Apple's real problem

Apple is in trouble again and loyalists everywhere are bemoaning the fate of the iconicized company.

Apple reported a $69 million loss for its first quarter, expects more losses this quarter and plans to cut as many as 4,000 jobs. All the usual excuses have been trotted out — Apple's strategic error in not licensing the Macintosh operating system, the inability to forecast demand for products, pricing missteps, the departure of key executives . . . blah, blah.

I'm tired of hearing these things. They mask the fundamental problem that has led Apple to this sorry state of affairs: the inability to shape a role for the company in the networked world.

No, please don't remind me. "Apple practically invented PC networking," you're going to say. "Linking Macintoshes was easy as pie." Great. But that was then and this is now.

Apple has not earned a place beyond the desktop, where its influence is fading. It is not a major player in server hardware or software. It doesn't control any of the high ground in the terrain of distributed computing.

In short, Apple simply isn't a factor in corporate networking.

Apple executives failed to embrace networking, and thus, Apple has no claim on client/server computing. Macs have been reduced to interesting — or pesky, depending on your world view — clients in nets controlled by the likes of Novell, Compaq and Microsoft.

And speaking of Microsoft, let's blame it for Apple's problems. "It doesn't play fair, it's too big," . . . so on and so on. Nonsense. Apple didn't stay ahead in innovation and it failed to realize that the market dynamics were shifting beyond the isolated desktop and small workgroup.

Microsoft saw that and, after some abortive attempts, is beginning to realize its network vision. Compaq saw that and pounced on the server market with claws bared. (Are you listening Dell?) The opportunities were there for Apple. The company just didn't execute.

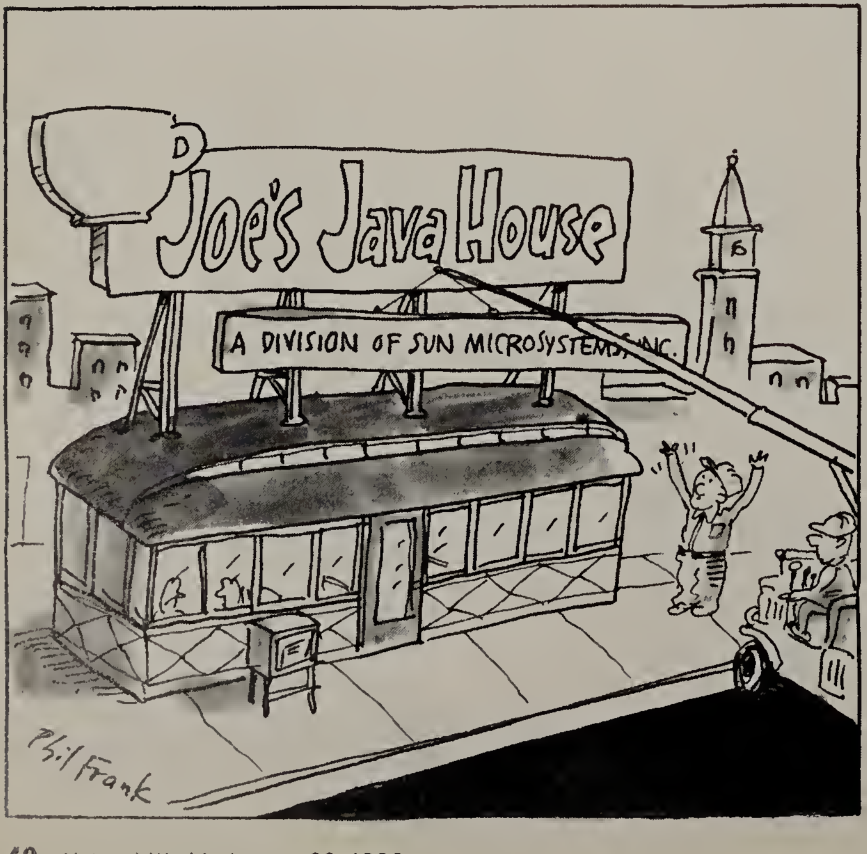
Can Apple save itself now? Can it take advantage of a once-in-a-generation opportunity like the Internet?

That just doesn't seem likely. Despite all the talk about resturcturing and new marketing plans, Apple still doesn't see itself as a network company.

*John Gallant, editor in chief* *jgallant@world.std.com*

## Teletoons

*By Phil Frank and Joe Troise*
*guru@well.com*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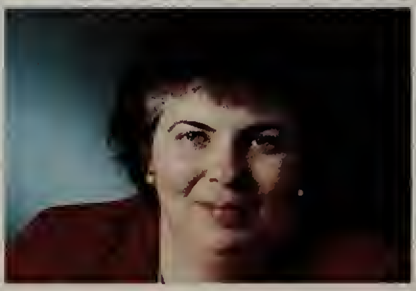
NETWORK CONVERGENCE

# Service levels have replaced platforms as the key management issue for users



**Mary Johnston Turner**

As the management platform wars wind down, bulletins continue to be issued from the front lines.

Hewlett-Packard Co. is reported to be edging out Sun Microsystems, Inc. for first place — at least according to some industry analysts. The talk is of Solstice delays, Tornado and Synergy status, new additions to NetView/6000 and what will happen to AT&T's OneVision now that the company is breaking up again.

While vendors continue to worry about market share and positioning with analysts, increasingly I wonder whether users really care all that much anymore. The platform wars are basically over, and there are a handful of survivors — notably HP, IBM, Sun and Cabletron Systems, Inc.

The real value to users is not the peace of mind that comes from selecting a platform that appears to be a survivor (although that helps), but in getting usable management data on how their networks and computing resources are performing. Often, for organizations that want to implement world-class management solutions, the investment in in-house staff or contracts with third-party integrators adds up to more than the cost of the tools and platforms.

*While vendors continue to worry about market share and positioning with analysts, increasingly I wonder whether users really care all that much anymore.*

In the past, for every company that committed to building a usable integrated management environment, many more users just gave up, having neither the funding nor the technical competence. Instead, they settled for off-the-shelf tools, which were better than nothing but still pretty frustrating to use. For these customers, help may be coming from an unlikely source — the Network Management Forum.

Currently, the forum is working on a standard for automating links between customer help desks and carrier trouble management systems using popular existing protocols such as Simple Network Management Protocol or remote procedure call (RPC). Previously, the group worked on many issues related to electronic bonding across carrier management systems.

Users are likely to see two benefits from the forum's work: higher quality global management from carriers; and a trickling down of the intellectual capital and developer effort that the carriers and their suppliers are investing to build carrier-scale integrated management systems. Eventually, the integration of many off-the-shelf management tools for use by carriers will lead to a new, more tightly integrated set of tools for users.

Most importantly, the forum is working to move the industry beyond tracking elements and events to tracking service levels as they impact actual end users. The forum is championing the concept of service management from the top down — that is, looking at the end-to-end service and application needs of the business and using those requirements to define management tools and applications.

If you haven't begun to apply this concept of service management to your own architecture, now is the time. Think about how to link information about network components, such as hubs and routers, to information about servers, desktops, applications and databases in a way that reports on the health and well-being of end-user applications. Management applications need to report end-to-end metrics for applications availability and response time from desktop to desktop, across LANs and WANs, and not simply link availability from router to router.

To be successful, network and systems managers need to be meeting with their business counterparts to identify those end-to-end management metrics that most closely track the health of the end-to-end applications. The question to ask is, what do the business managers want to know about the performance of the network and the applications? Then they need to work on the problem of generating those types of reports.

With staff dollars shrinking ever lower and executive tolerance for investments in expensive management tools waning, users and their suppliers must up the level of the management discussion from components and platforms to focus on end-to-end service management issues. If senior executives are to continue to fund information technology (IT) investments, they need better reports on how these investments are performing. And they need those reports to be stated on a service basis that reflects the end-user experience of the situation.

The hottest management solutions of 1996 are likely to come in the form of bundled management suites that provide a decent amount of integration, automation and correlation across management information provided by network equipment, servers, desktops and middleware.

Service management is a whole new way of thinking about the management problem. Effective implementation of a service management approach will force IT managers to revamp many of their management work processes and will force management application suppliers to address more complex development challenges. But it will make the operations staff much more efficient and begin to allow reporting on the performance of networks and systems assets in a format that makes sense to senior executives and end users.

In the long run, good management reporting — which clearly demonstrates the business value of IT tools and staff — may make it easier for network managers to get their next upgrade approved. Imagine, the day may come when management tools help pay for themselves.

*Turner is a vice president with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.*

EMPLOYMENT ISSUES

# Balance use of foreigners with investment in training

**Jennifer Grey**

Used correctly, our country's openness to temporary foreign employees generates clear benefits. It helps bring domestic programmers up to the best international levels of technological know-how, allows U.S. clients to go forward with economically rewarding projects and improves the general competitiveness of the U.S.

These benefits are central — yet largely overlooked—in the current congressional debate over whether to restrict the number of foreign workers admitted to the U.S. under a provision of the immigration law known as H-1B.

Proponents of restricting H-1B visas claim that some unscrupulous U.S. companies are using the accessibility of foreign workers as a wedge to bring in low-wage, low-level programmers to displace domestic workers. Critics contend shortages in state-of-the-art programming and other electronics expertise make continued use of foreign workers a necessity.

On the surface, this seems like a real dilemma. Yet one question would help resolve the argument: How much do employers of temporary foreign workers spend to train their domestic American employees?

If the answer is ''little or nothing,'' then the employer is doing nothing proactive to decrease its dependence on foreign workers. But if the answer is ''a lot,'' then the employer is almost certainly adding to the overall capability of the domestic workforce and should not be penalized for using foreign workers.

My company annually spends between 2% and 3% of our revenue on training. This year, the number of recent college graduates we train will rise from 100 to 150, and the number of mid-career trainees from outside the company will grow from three to 50. We even have a program for training inner-city high school graduates to become entry-level programmers and network administrators — a program that also will include more people this year.

In all these training efforts, H-1B temporary employees make critical contributions. Our internal Microsoft certification effort in 1995 was led by a temporary worker from India. Similarly, our client/server prototyping program was led by three temporary workers from abroad.

It's no accident that in these and other instances foreigners are instructing Americans. During 1995, the growth in demand for new information management applications in this country has essentially sucked dry the pool of trained Americans.

At the same time, many larger companies that in the past trained workers have cut back those efforts as part of general downsizing and cost cutting.

Right now, the most accessible expertise is in countries where training has historically been good but economic growth has slowed — such as in the U.K. and Australia. Such expertise is absolutely critical if we as Americans want to maintain our momentum in information management.

When the ratio of experienced to inexperienced workers is in danger — as it is now — the result is a slowdown in project implementation. We're already seeing a number of companies postpone projects that would significantly upgrade their performance simply because they don't believe the necessary experienced talent will become available.

In short, we're on the verge of a potentially vicious cycle: Fewer experienced programmers leading to fewer projects, leading to fewer training opportunities for Americans, ultimately leading to fewer experienced programmers and another downward phase of the cycle.

The solution is not to block help from experienced temporary workers from other nations. Instead, we should view their availability as a windfall to be used as intelligently as possible to increase our overall national technical expertise.

Congress can do this by insisting companies that make use of the privilege of hiring temporary workers under the H-1B program should also invest an appropriate amount in the training of American programmers. Such a provision would be easy to measure and enforce — and good for both the industry and the economy.

*Grey is director of operations at Complete Business Solutions, Inc., a computer systems integrator and software development company based in Farmington Hills, Mich. She can be reached via the Internet at JGrey@cbsihq.cbsinc.com.*

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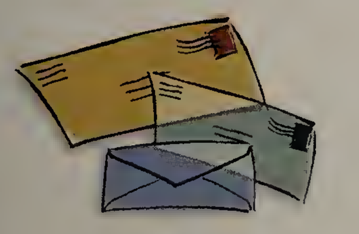

# IN-BOX

## Go, Gates

I enjoyed Mark Gibbs' ''devilish'' letter to Bill Gates (Dec. 18, 1995, page 33). I started out in this business 18 years ago, when Microsoft Corp. was a mere babe. Way back then, there was no such thing as compatibility.

Then along came Gates and IBM and there was a standard. Peripherals soon became easy to install, and software worked on most systems.

Gates and all Microsoft stockholders deserve every nickel they make. This is a free-market system; they should compete with everything they have. The bottom line is Microsoft's stuff works and is widely accepted by users. If it didn't work, Microsoft would be like Novell, Inc. and its subsidiary WordPerfect, losing market share day by day.

Microsoft's entrance into the Internet world can only do good. It will spark new technologies and spur development of new businesses — and maybe Gates will acquire a few.

In fact, next year, he'll probably buy NBC outright from General Electric Corp.

*Jay Berman*
*President*
*Premiere Network Communications*
*Vista, Calif.*

## A vanishing breed

Regarding David Buerger's column ''Network managers should plan now to avert career disaster'' (Dec. 18, 1995, page 58):

For the last two years, I have maintained that network administrators will be few and far between in the new computing environment. Take me, for instance: I am a Certified NetWare Engineer with six years of corporate networking experience and two years of business consulting experience. I am a creative problem solver.

However, in two years, I won't be able to get a net administrator job because they won't be around. Net software is becoming more and more self-administrative and user-based.

Take Windows 95, for instance. Users could literally get themselves up and running on a network simply by knowing a user ID. Period. Far cry from having me run a cable, install a card, create a disk, connect you to the server, create you as a user, set your login script, install your local applications and so on.

Networks are becoming more and more of a commodity. The last nail in the coffin will be when motherboards come with Ethernet adapters that can be upgradable via software to 100M bit/sec. Intel Corp. should buy 3Com Corp. — that would just about do it.

*Patrick Grote*
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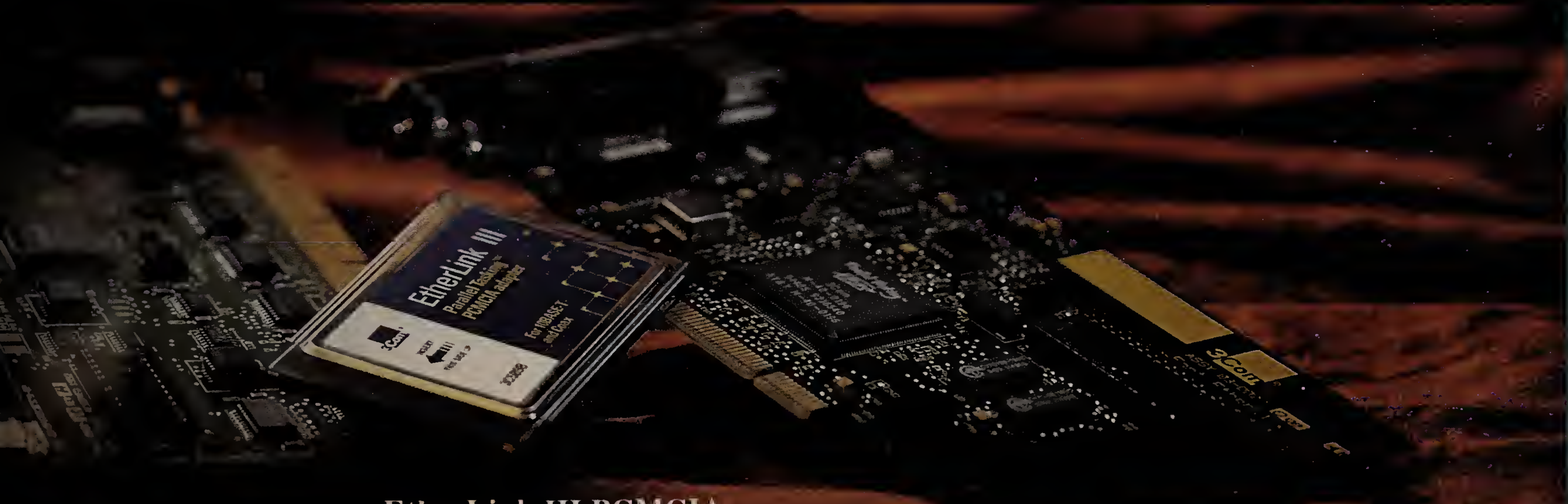

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# Make your

### As key products trickle out, it's time to assess whether to take the leap to client/server E-mail.

**By Elisabeth Horwitt**

Electronic Arts is so eager to migrate from Microsoft Mail to Exchange, it may end up installing the client/server messaging platform while it's still in beta, says Karen Alonardo, network operations manager for the San Mateo, Calif.-based video game company.

Why such urgency to get on the bleeding edge of messaging? "We have about 1,500 users worldwide, and E-mail is our lifeblood," Alonardo says. "[Microsoft Mail] Version 3.2 is a DOS-based, file-sharing E-mail system, which means we're very limited in what we can do."

After suffering through several release date slips last year, she has no confidence in Microsoft Corp.'s latest promises to release Exchange in the first quarter. But Electronic Arts employees are clamoring for Exchange's promised groupware services. Everyone from field sales personnel to software programmers, artists and marketing managers "want to hold group discussions, schedule meetings, collaborate via document sharing," she says.

Alonardo's company is far from alone. "Corporations need to deploy industrial-strength E-mail in the next five to seven years," in order to keep up with the explosion of E-mail usage in-house, says Gary Rowe, a principal at Rapport Communication. The Silver Spring, Md., electronic messaging consultancy expects to see message volume grow more than 20% annually through the year 2000.

Driving this growth is a rapid proliferation of "industrial-strength applications using electronic forms-based communications," Rowe says. These range from mail-enabled applications, such as scheduling and group forms sign-offs, to groupware applications that let experts located around the world share knowledge and collaboratively generate information documents.

In order to support such applications effectively, Rowe says companies must make "a fundamental shift in the E-mail infrastructure," from file-based E-mail platforms, such as Microsoft Mail and Lotus Development Corp.'s cc:Mail, to client/server platforms.

Currently available client/server messaging systems include Hewlett-Packard Co.'s OpenMail, Lotus' Notes, Banyan Systems,

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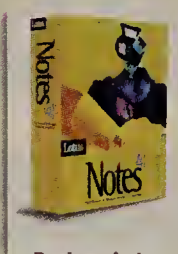
- Mixed reviews for Internet alternative Page 50



Review: Lotus Notes 4 gets a standing O. Page 51

# move

Inc.'s Intelligent Messaging, SoftArc's First Class and ICL Enterprises NA's Embla. But a big market change is coming with the availability of Notes Release 4 — which started shipping to large customers less than two weeks ago (see story, page 51) — and Exchange, says Joyce Graff, research director of electronic messaging at Gartner Group, Inc.

Their debut means two major players will, for the first time, be fielding messaging platforms whose scalability and manageability are on par with HP's OpenMail, she says.

While Notes Release 3 is client/server, it only supports about 120 users per server, according to Graff. OpenMail, Notes Release 4 and Exchange will all support 1,000 or more users per server.

### Vive la difference

File-based messaging architectures "have limitations that are inherent in the way they are designed," says Sara Radicati, president of The Radicati Group, Inc., a Palo Alto, Calif., consultancy.

Such platforms are technically client/server-based. However, most of the intelligence resides on the client application, with the server basically acting as a passive, DOS-based message storage engine. Clients must log on to the local post office, then download all waiting mail as a file.

A separate DOS machine typically acts as the message transfer agent (MTA). It checks a post office's outgoing mailbox and routes nonlocal messages to other post offices, often across several intermediate MTAs. Corporations often need to install separate gateways for handling translation and directory synchronization across multivendor messaging systems.

True client/server messaging platforms put far more intelligence on the back end. Typically, the jobs of directory, post office, message storage, routing and gateway are handled by one or more powerful machines running operating systems, such as Unix or Windows NT. The client and server communicate interactively via remote procedure calls running over popular transport protocols such as TCP/IP.

These architectural differences give client/server messaging platforms a number of advantages over the older

*Continued on page 46*

ILLUSTRATIONS BY SALLY WERN COMPORT

## Tips for making the transition

Once you've determined client/server messaging is right for your organization, the next step is to define what the new architecture needs to accomplish and devise a transition plan.

Gary Rowe, a principal at the Silver Spring, Md., electronic messaging consultancy Rapport Communication, suggests the following steps:

**STEP 1:** Take an inventory of the current messaging installation, including "what works, what doesn't and traffic patterns," such as message and attachment size, as well as number of recipients, Rowe says.

**STEP 2:** Gain an understanding of user requirements now and for the next few years. Rowe suggests looking at how users are leveraging messaging. Is usage casual or mission-critical? User-to-user or application-based?

**Gary Rowe** *has some sound advice.*

Then analyze user needs in specific areas of the messaging architecture. Client-related requirements, for example, might include the look and feel of the user interface, operating system support, a universal in-box and support of existing desktop applications through API standards such as Microsoft Corp.'s Messaging Application Programming Interface. Some server features to consider are rules-based routing, groupware integration, reliability levels and maximum acceptable delivery time.

Interconnection aspects include security levels, support of binary attachments, message nondelivery notification, and connections to other messaging environments via X.400 or SMTP.

**STEP 3:** Get your organizational ducks in a row. This means finding an upper management sponsor, setting up vendor partnerships, coming up with business justifications for the move and getting business units to buy in, Rowe says.

**STEP 4:** Evaluate costs. A migration budget to consider contains learning curve and education, project planning and development, direct purchase costs, deployment, maintenance and support, and conversion of legacy systems.

Corporations almost invariably underestimate migration costs, analysts agree. "Companies don't understand the process typically takes 12 months," says Sara Radicati, president of The Radicati Group, Inc., a Palo Alto, Calif., consultancy.

**STEP 5:** Design your system. One important question to consider, Rowe says, is whether to build a private messaging backbone, go with a public carrier or combine private and public offerings. Other design considerations include build vs. lease, messaging and directory configurations, naming and application support.

### HELPING HANDS

The good news is that leading vendors are coming up with migration aids such as utilities to port existing post office directories to the new system. "We tested Exchange and Notes 4 in our lab and were impressed with how much easier they are to bring up and install," Radicati says.

"Microsoft's [server migration utilities] seem pretty reliable from the testing we've done so far," says Karen Alonardo, net operations manager for Electronic Arts, a San Mateo, Calif.-based video game company. One utility "is transferring over our global address list [from Microsoft Mail], so not a lot of manual labor is involved."

Microsoft also provides synchronization between Exchange and Microsoft Mail directories, enabling users to make the transition "one server, one office at a time," Alonardo says.

In addition, IT managers are developing their own transition kits and utilities. At BellSouth Corp., for example, "Early adopters, who were the most technically astute, simply got a new ID and left the old environment," says Bob Stevens, manager of collaborative computing for the holding company's regulated arm. "To others, who needed some hand-holding, we gave tips, short forms of documentation and guidelines about how to move things like folders."

– Elisabeth Horwitt

# Moving to Client/Server Messaging

*Continued from page 45*

file-based offerings. Among them:

- **Server-based messaging services.** Because the server component of a client/server messaging system is both intelligent and multitasking, it can handle applications and services that would be onerous or impossible for the client.

"The whole client/server approach allows you to put in processes that are independent of the client," says John Dubiel, manager of planning and technology for Boston Edison Co. The utility currently uses the file-based cc:Mail, which he says "has a fat client and a thin server." This means, for example, that users can't program the cc:Mail server to do rules-based rerouting of their incoming messages while they are on the road. "The only way you can do that [with cc:Mail] is to keep your PC logged on the whole time you're away," Dubiel says.

Also, with client/server systems, a server can be programmed to notify clients of waiting mail, or to automatically download documents with keywords or messages from key people. To do the same with a file-based system, users must check their mailbox on the server at regular intervals, either manually or through a client-based polling mechanism.

Another problem with file-based systems is that users must download all documents first, then browse through them locally. This tends to use up a lot of networking bandwidth and client memory — not to mention end user work time.

- **More scalable architecture.** The prospect of being able to consolidate dozens or even hundreds of DOS-based post offices and MTAs into a few Unix or NT servers is another attraction.

While file-based post offices can support only 100 to 200 users, client/server systems can support 500 to 1,000, according to David Ferris, president of Ferris Research in San Francisco. This is partly because a Unix or NT server is a lot more powerful than a DOS-based system. Furthermore, in file-based systems, clients must be logged on to a local post office's disk drive in order to send or receive mail. That limits the number of concurrent users to the number of logons a post office can support.

"Typically, you don't want more than about 100 users per server because out of 100 mailboxes, probably five to 10 will often be processing mail at the same time," Ferris says. Beyond that number, he says performance on DOS-based E-mail systems deteriorates rapidly.

- **Faster throughput.** Several factors make message delivery faster on client/server systems. First, since client/server systems support more users per server, a larger percentage of messages are local. Furthermore, nonlocal messages typically get sent right away to the correct server.

In a file-based configuration, nonlocal messages typically wait in the local post office queue until the local MTA gets around to polling — usually five minutes, Ferris says. And outgoing messages often need to travel across many more nodes to get to their destination — each a potential source of delay or outage. Once the message arrives, it waits in the user's in-box until the client system calls in for mail.

- **Greater manageability.** The ability to consolidate larger user populations and diverse functions onto a small number of servers has major cost-of-ownership implications, particularly for large enterprise messaging installations, analysts and users point out (see story, this page).

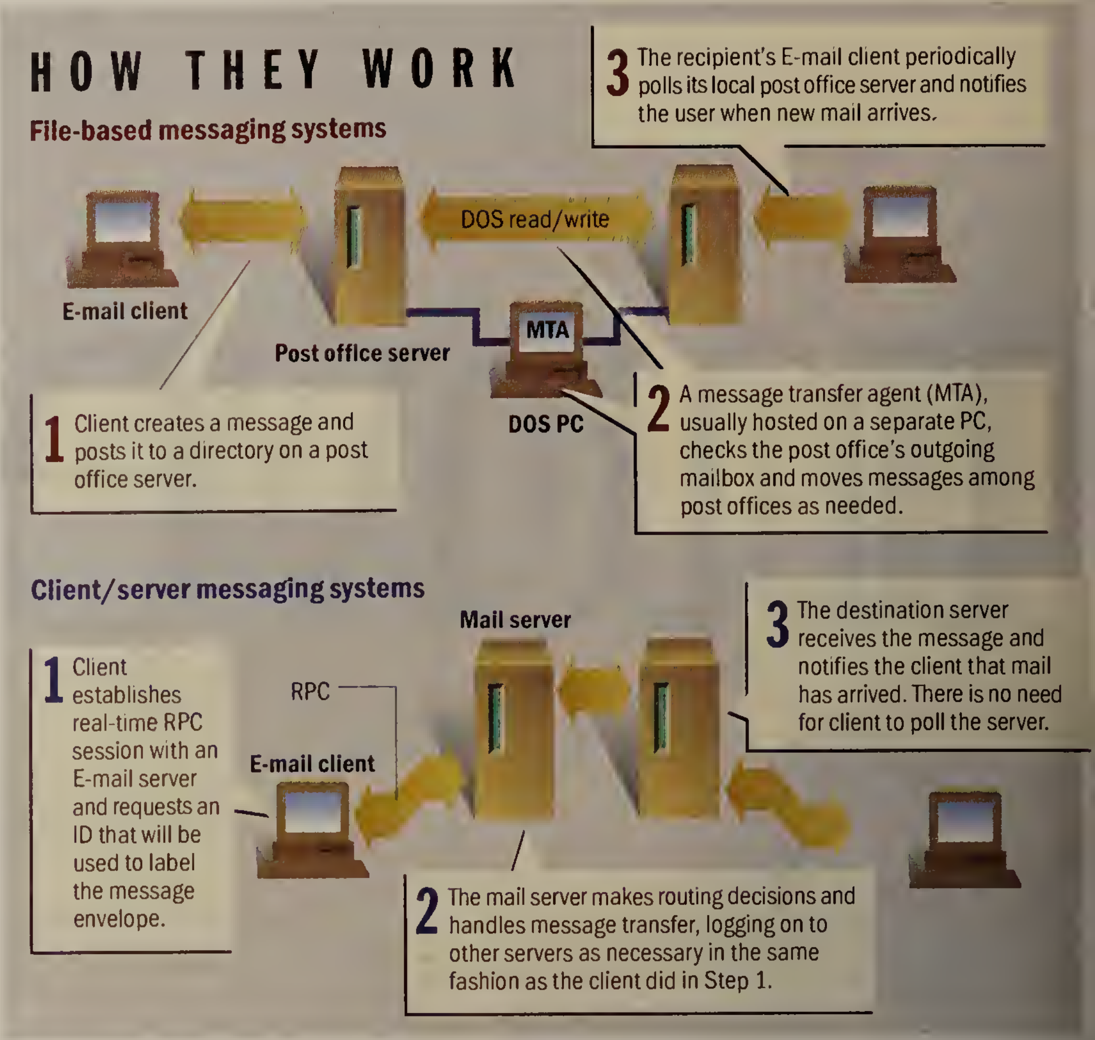
For example, moving from cc:Mail to Exchange will enable Electronic Arts to integrate the external gateways that connect cc:Mail post offices together into a single server with a robust operating system such as NT Advanced Server, Alonardo says. "That alone will save us hours and hours" on routine administrative tasks such as directory updates and file maintenance, she notes.

- **Mix and match modularity.** Some leading client/server messaging systems provide an open, integrated messaging infrastructure that will support users' choice of E-mail, groupware and mail-enabled applications, such as scheduling, calendar and workflow. Users can also choose to access those applications from any popular client operating system and any messaging front end that supports Microsoft's Messaging Application Programming Interface (MAPI) standard.

Products such as HP's OpenMail and Banyan's Intelligent Messaging support the above capabilities now. Other vendors claim to be readying similar offerings.

For example, Novell, Inc.'s GroupWise XTD, due to ship in the second quarter, will consolidate GroupWise and Novell Message Handling System installations under a common MTA and message store, says Stuart Nelson, business manager for the GroupWise unit. You will be able to maintain and update user logons and

## HOW THEY WORK



**File-based messaging systems**

1 Client creates a message and posts it to a directory on a post office server.

2 A message transfer agent (MTA), usually hosted on a separate PC, checks the post office's outgoing mailbox and moves messages among post offices as needed.

3 The recipient's E-mail client periodically polls its local post office server and notifies the user when new mail arrives.

**Client/server messaging systems**

1 Client establishes real-time RPC session with an E-mail server and requests an ID that will be used to label the message envelope.

2 The mail server makes routing decisions and handles message transfer, logging on to other servers as necessary in the same fashion as the client did in Step 1.

3 The destination server receives the message and notifies the client that mail has arrived. There is no need for client to poll the server.

## Messaging management means cost savings

**One of the most common reasons users give for migrating to client/server messaging systems is to take advantage of their more functional and cost-effective management and administration features.**

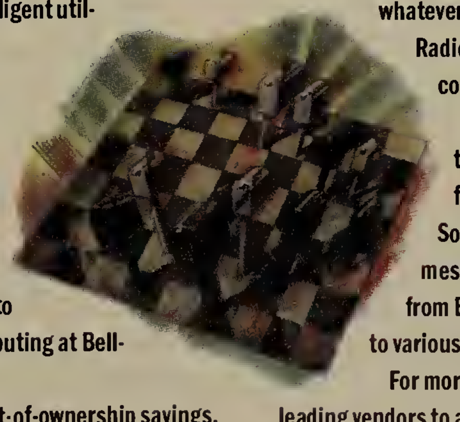
**Besides supporting a far larger number of users per node, which translates into fewer nodes to administer and fewer potential trouble spots, client/server messaging platforms support management agents and other intelligent utilities that most of their file-based counterparts lack.**

**Hewlett-Packard Co.'s OpenMail, for example, equips each server with a monitor that sends alarms if disk space starts to run out, queues get too long or someone repeatedly tries to log on with a bad password.**

**In contrast, few file-based systems can be managed remotely. "If there's a hangup on a DOS-based server running file-based messaging, you need someone on-site to reboot," says Bob Stevens, manager of collaborative computing at BellSouth Corp.**

**More effective management translates into major cost-of-ownership savings, analysts agree. Figuring one administrator earning $50,000 per year can manage four post offices of 100 users each, a file-based messaging platform costs $125 per mailbox per year, according to a recent issue of "Ferris Messaging Analyzer," a newsletter published by Ferris Research, Inc. of San Francisco.**

**With client/server systems, most organizations expect ratios of roughly one support person for every 2,500 users, or $20 per mailbox, according to David Ferris, president of the research firm. That's because there's "much less time spent doing directory synchronization, backups and debugging routing tables," he says.**



**Further tilting the scales in the near future are sophisticated management tools that leading vendors – including HP, Microsoft Corp. and Novell, Inc. – are developing for their client/server messaging platforms (see graphic, this page).**

**The major drawback of most of these tools (OpenView being a notable exception) is that they only work with the vendor's own messaging servers and whatever third-party clients and applications work with them, says Sara Radicati, president of The Radicati Group, Inc., a Palo Alto, Calif., consultancy.**

**There are third-party vendors addressing at least basic multivendor mail management requirements for systems ranging from IBM's PROFS to Lotus' cc:Mail. MailCheck from Baranof Software in Watertown, Mass., for example, installs agents on messaging nodes and then polls them for status reports. Topper from Bear Mountain Software in Evergreen, Colo., sends probes out to various messaging nodes to check throughput and availability.**

**For more in-depth management, however, users will have to wait for leading vendors to adopt standardized Management Information Bases (MIB) that enable messaging nodes to provide information to a central Simple Network Managment Protocol-based console, Radicati says.**

**The Electronic Messaging Association recently came out with a group of SNMP MIB extensions that she says support "detailed management" of messaging systems, including "remote administration of MTAs and gateways, monitoring of queue lengths and message tracking" across any messaging system that supports the MIB. But industry support for this standard is still in the evaluative stage.**

**– Elisabeth Horwitt**

### On the mail management horizon

**HP:** Will ship in June an OpenView-based facility that enables topological changes and events taking place on the physical network to be reflected in the OpenMail configuration, and vice versa. OpenView already supports application configuration and user account management, and can monitor various processes, queues and servers.

**IBM/Lotus:** Notes 4 will ship with a management system that can be programmed to report and respond to events based on preset service metrics.

**Microsoft:** Expected to provide with Exchange an integrated, centralized console from which administrators can monitor and configure Exchange servers across the enterprise.

**Novell:** NW Admin tool enhancements will let users administer E-mail accounts and directories across NetWare 4.1, the upcoming GroupWise XTD client/server messaging platform and any third-party application that supports the NW Admin "snap in" API, such as Lotus Notes. No delivery date has been set.

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access rights through a common NetWare Directory Services directory and NWAdmin administration tools, he adds.

In addition, GroupWise XTD will support MAPI 1.0, enabling compliant packages such as Banyan's BeyondMail to "plug in and access shared folders and E-mail in-boxes," Nelson says. Also supported will be Microsoft's Windows 95 Exchange client, "so users need not buy NT and Exchange Server," he adds.

Furthermore, Novell is developing and publishing APIs that will enable third parties to write to GroupWise XTD's underlying infrastructure and take advantage of GroupWise services, such as calendaring and scheduling.

**Vendor posturing**

Why, then, has the corporate migration to client/server been so slow? "Very few companies are migrating from file-based systems right now because the major players' client/server products aren't ready yet," Ferris says.

"Sure, we'd like to upgrade to client/server messaging, but at a reasonable cost, and we have to gain something," Boston Edison's Dubiel says. "The products we see right now don't cut it."

Top items on Boston Edison's messaging wish list include an integrated directory service, centralized management and full compliance with standards such as X.400 and X.500, "so we can interoperate in the future as a virtual corporation," Dubiel says. Microsoft's Exchange is expected to offer many of these features, he says. "[But] I don't want to plan on an undelivered product."

**more on NetworkWorld Fusion**
**http://www.nwfusion.com**

- **Rapport Communications reports on next-generation offerings from Lotus, Microsoft and Novell.**
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**From the main menu, select NetRef, Technology Resources, then E-mail.**

While Exchange is supposed to ship in first quarter, Novell has yet to lay down a firm timetable. The first version of GroupWise XTD, due out in the second quarter, only initiates the roll out of key features, such as an integrated directory and administration infrastructure, according to Nelson.

**Lotus' mixed message**

Lotus, meanwhile, has been confusing its customers by providing, and promising, alternate ways of migrating from the file-based cc:Mail to a client/server architecture.

Lotus is also heavily pushing the recently released Notes Mail, which combines the user-friendly cc:Mail front end and a limited version of Notes. Notes Mail has appeal for firms that are not up to administering and setting up the full Notes product suite, but want their users to have Notes capabilities such as discussion databases, says Gartner Group's Graff.

Not all users are impressed, however. "Notes Mail will be looked at as the ugly half-sister to Notes; people would be impressed if Notes didn't exist," says Jack Dausman, assistant director of IS for Univax Biologics, Inc./North American Biologicals, Inc. (NABI), a Rockville, Md., biotech firm. Users that want an easy-to-install, "idiot-proof messaging system" are likely to stick with cc:Mail, he adds. Version 7 of cc:Mail, a true client/server version, is expected to ship later this year.

Adding to the confusion, Lotus is positioning just-released Notes 4 as an integrated groupware and messaging back end, also with a cc:Mail-like user interface. Companies can maintain existing cc:Mail installations at smaller offices, with the users linking up to Notes services through their post offices, Graff says.

**Mapping out strategy**

Amid the product rollouts and promises, you've got to decide whether to make the migration to client/server messaging, which analysts agree may be bumpy and time-consuming, not to mention costly.

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*Continued on page 50*

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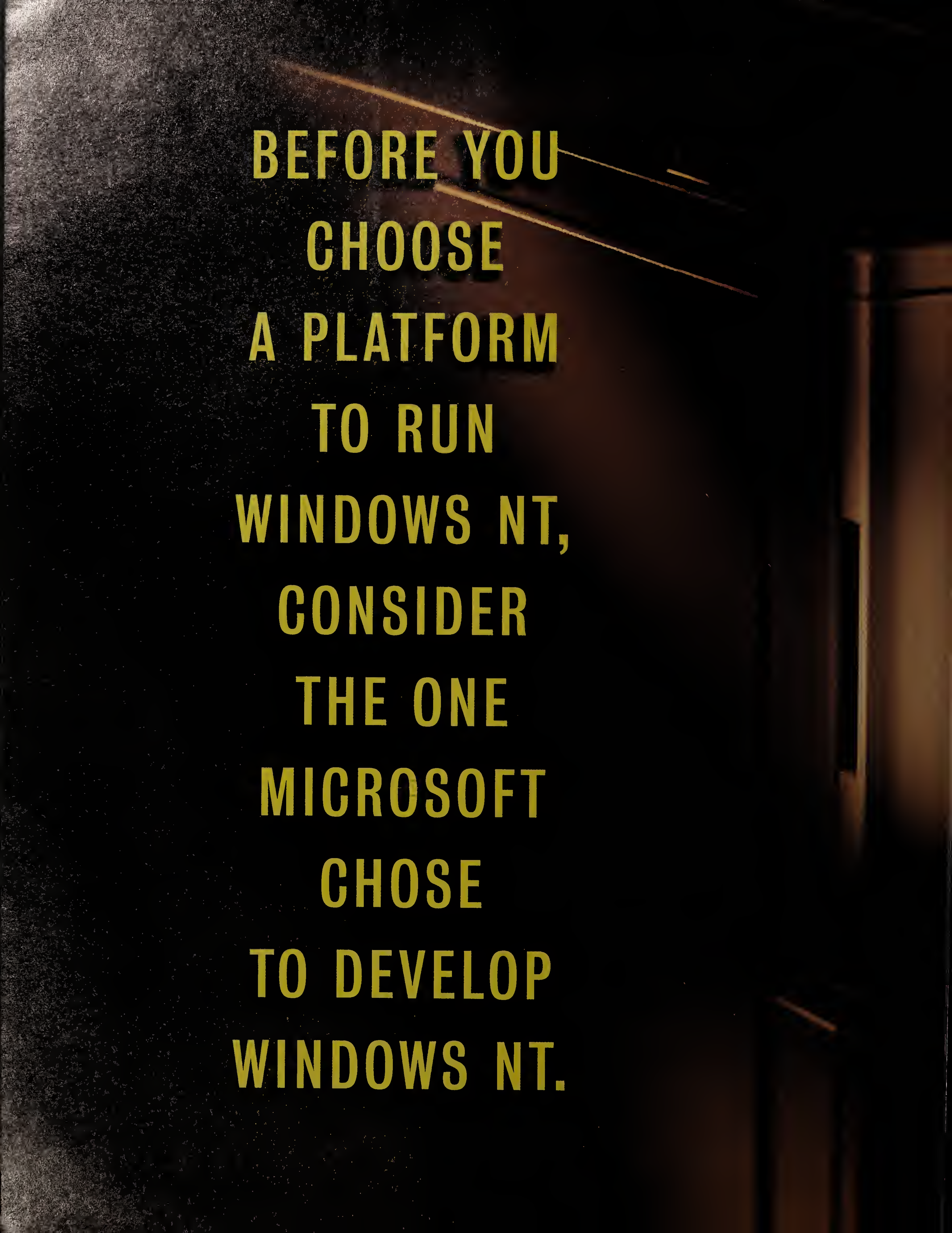
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# Moving to Client/Server Messaging

*Continued from page 47*

Wise NetWare Loadable Module acting as a message server at headquarters and DOS-based GroupWise message servers at other offices. "There's quite a bit of hardware spread out all over, but it works fine," says Joel House, manager of IS for the firm.

Hardware and software upgrades aside. it will cost a total of $5,000 to $7,000 "just to send an engineer out to each of our offices to upgrade each server" from GroupWise to XTD, he says.

House needs a clearer sense of XTD's benefits before making migration plans. "It has to offer us features that we consider mission critical, like better integration with the Internet," he says.

Analysts say that's a good, cautious tack to take.

"A lot of companies just start buying up products, then go into some department and start replacing the old ones without an overall plan for migrating the whole organization," Radicati says. "They spend a lot of money, and end up with products that don't interconnect or interoperate well."

Instead, you need to consider whether your messaging needs justify the move to a client/server architecture, Graff says.

One simple criterion is size of installation, since the bigger the user base, the clearer the cost advantages of client/server, analysts agree.

A Gartner Group study commissioned by HP found that while OpenMail and file-based messaging cost-of-ownership is about equal at 20-user sites, the cost for file-based systems is almost double that of OpenMail in a 20,000-user enterprise. The area that accounts for most of that difference is system integrity: ensuring that nodes are up and messages go through reliably.

However, "even in large companies, there is some argument for a simpler file-based product," Graff says. For example, a company may consist of fairly autonomous units, limiting the need for an enterprise-class messaging system.

The level of migration urgency also depends on the brand of file-based messaging system now in use, Graff suggests. She notes that Microsoft, for example, is pressuring its users to move to Exchange within two years by shutting off support for Microsoft Mail.

Lotus is also pressuring its customers to move from cc:Mail to Notes, or Notes Mail. However, Graff notes that some cc:Mail customers "are saying the pressure [to move] is off" because Lotus fixed cc:Mail's "biggest problem, file corruption, with Version 6."

Graff predicts that once platforms such as Exchange and GroupWise XTD have shipped and proven themselves, migration should really take off, with 60% of companies making the move by the end of 1997. However, only about 20% of file-based messaging installations will have migrated to client/server by year-end.

Univax/NABI is one firm for which migration has taken on an urgency. "It's a big sell job because most users think everything works now," Dausman says. But the proliferation of corporatewide message-enabled applications, such as "faxing, mobile dial in, groupware and Internet access are driving the need for a more scalable, manageable infrastructure."

Further weighing the scales is Univax's recent merger with another biotech company, which boosted the total user population from 150 to 2,000, Dausman adds. "If we don't put in a [client/server] messaging architecture very soon, our throughput is going down to zero."

*Horwitt is a freelance writer based in Waban, Mass. She can be reached via CompuServe at 75244,1666.*

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# Mixed reviews for Internet alternative

Jack Dausman considered using the Internet as a common backbone for his company's multivendor messaging installations, but he ultimately rejected the plan.

The main reason: The 'Net offers no guaranteed access or delivery time for messages, says Dausman, assistant director of IS at Univax Biologics, Inc./North American Biologicals, Inc. (NABI), a Rockville, Md., biotech firm.

Univax/NABI is far from alone in viewing the 'Net as a promising but flawed messaging vehicle. "A lot of people are thinking about using the 'Net for messaging more than doing it," says Joyce Graff, research director of electronic messaging at consultancy Gartner Group, Inc.

The majority of the 'Net's drawbacks stem from its nature – a loose conglomeration of semiautonomous networks with no centralized adminstration or global directory. Once a message is sent, users have no way to determine its route or how long it will take to get there. And the 'Net lacks an ac-knowledgement system to let the sender know if and when a message reaches its destination, and when the recipient picks it up.

Locating resources can be tedious, and users need to know an individual's address before they can send mail. Moreover, lack of standardized, global security and reliability mechanisms continue to discourage many companies from entrusting mission-critical material to the 'Net.

BellSouth Corp., for example, expects to use Simple Mail Transfer Protocol, the Internet messaging protocol, "for daily, more casual activities, such as swapping information with a customer or vendor about a project," says Bob Stevens, manager of collaborative computing. But the firm will use X.400 for more time-sensitive and critical transmissions. He says the ISO standard has better security and message-tracking mechanisms.

The good news is that vendors are hard at work overcoming the Internet's chief drawbacks as a corporate messaging vehicle. By the year 2001, the majority of Internet backbone links will have migrated to 45M bit/sec T-3, eliminating most bottlenecks and providing a viable vehicle for multimedia applications, says Daniel Blum, a principal at Rapport Communication.

Around that time, crucial services such as certification, authentication, acknowledgements and hacker-resistant sender identification will be "a basic part of Internet operation," he adds.

Perhaps looking ahead to that day, a small but growing band of pioneers are already choosing the 'Net as their primary corporate messaging platform. One such company is Howmet Cercast Canada, Inc.

"We picked the Internet as an easy, efficient and cost-effective way for us to pick up customers' drawings and specifications," says Mike Petkoff, IS director for the Georgetown, Ontario, firm. "We pay about $20 a month for a mail connection, plus $6 per hour of connect time."

While some of the manufacturer's customers are still leery of using the 'Net for security reasons, Petkoff says "that issue is slowly going away."

Although Howmet Cercast has not experienced bandwidth or reliability problems, the 'Net is not without drawbacks, Petkoff says. In particular, for critical, time-sensitive documents, "You can't just sit back and let the 'Net take its course."

– Elisabeth Horwitt

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# BellSouth makes its messaging call

BellSouth Corp.'s decision to rightsize its messaging architecture had nothing to do with saving money. "IBM's PROFS is cheaper to maintain than anything that exists," says Bob Stevens, manager of collaborative computing for BellSouth's regulated telecommunications services division.

But he did hope to boost productivity by "giving users at the desktop access to everything they need in an integrated, coordinated fashion."

The problem BellSouth faced back in 1993 – now familiar to many Fortune 500 corporations – was finding a LAN-based system with scalability, throughput, ease of administration and reliability comparable to the company's host-based system.

One goal, for instance, was for the new platform to at least equal the old one's maximum message delivery time of 15 minutes, Stevens says.

The problem was not a trivial one, given the size of BellSouth's messaging user base – 35,500 strong and spanning its nine-state territory. The new LAN-based platform would be taking on 3,000 IBM Professional Office System (PROFS) users, 18,000 Digital Equipment Corp. All-in-1 users and 12,000 users of an internally developed Unixmail-based system. Also migrating were some 2,500 Lotus Development Corp. cc:Mail users.

**Bob Stevens** *rightsized his messaging architecture to increase productivity.*

Having studied what the market had to offer, Stevens' group concluded that a file-based messaging platform simply would not do the job. Stevens estimated it would take 500 to 1,000 file-based post offices, routers and gateways to support BellSouth's messaging needs. That translated into lots of hops for messages to take and lots of potential points of failure.

BellSouth chose Hewlett-Packard Co.'s OpenMail, one of the few true client/server messaging platforms available at the time. The HP-UX-based OpenMail had the scalability BellSouth was looking for, with one server able to support thousands of users. "We're looking at probably two dozen servers to support all [messaging] processes," Stevens says.

OpenMail also supports both the Simple Mail Transfer Protocol and X.400 message transport standards, which Stevens says is crucial for exchanging messages with users outside the company.

Another key OpenMail feature, he says, is support of major messaging APIs, such as Microsoft's Messaging Application Programming Interface (MAPI) and Vendor Independent Messaging.

This will let Stevens' group move existing cc:Mail clients over to OpenMail servers, while eliminating cc:Mail post offices and gateways.

OpenMail's broad API support also ensures that in-house message-enabled application developers "have a choice in how to integrate [an application] with the messaging back end," Stevens says. "Not all application vendors support MAPI."

BellSouth is taking its migration to OpenMail slow and easy, with 1,000 to 1,500 users switching each month since January 1994. The company is on schedule to complete the migration by year-end.

This gradual migration has not been entirely painless, Stevens admits. For one thing, IS must synchronize directory updates across the various messaging platforms every night. "With [thousands of user] entries, it's hard," Stevens says. The task is accomplished by having "various platforms send in updates to a master hub, which mashes them together and propagates them back across the different systems."

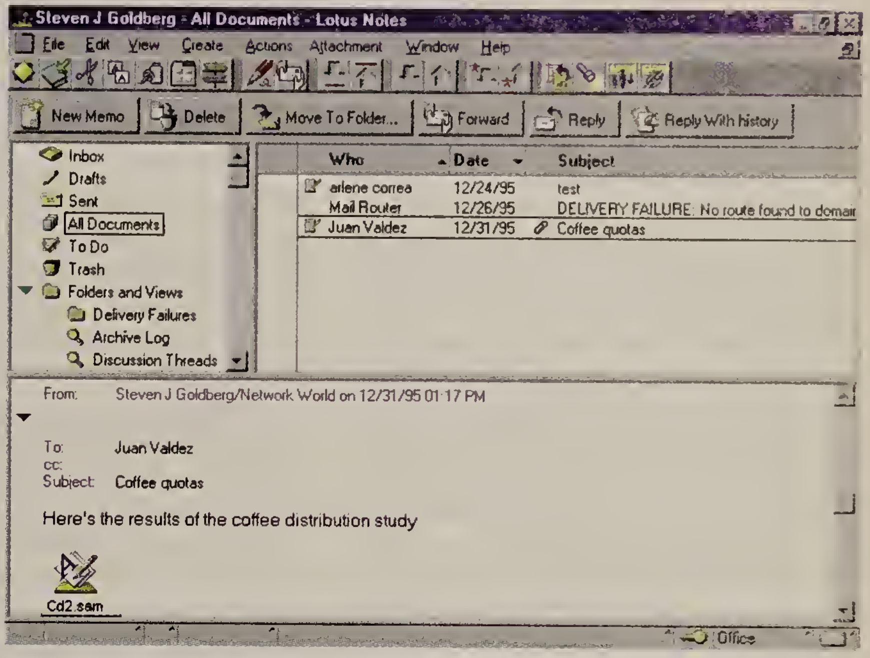
On the plus side, the new platform has bettered the throughput of the host-based system, he says, with message delivery averaging between 5 and 10 minutes "from one end of the network to the other."

– Elisabeth Horwitt

# Notes 4-bagger

## Lotus hits a grand slam with its latest groupware release.

### By Steven Goldberg



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| Mail Router | 12/26/95 | DELIVERY FAILURE: No route found to domai |
| Juan Valdez | 12/31/95 | Coffee quotas |

From: Steven J Goldberg/Network World on 12/31/95 01:17 PM

To: Juan Valdez
cc:
Subject: Coffee quotas

Here's the results of the coffee distribution study

**Figure 1:** *The new look for Notes databases features a three-pane view showing database organization, document lists and their contents.*

With the game on the line and Microsoft Corp. hurling fastballs from the mound, IBM's newly acquired Lotus Development Corp. has blasted a towering home run with Notes Release 4. This major release expands on almost all Notes Release 3 features, while adding countless others. The result is an enterprisewide groupware, messaging and development environment with built-in ties to the Internet.

Notes Release 4. offers more for beginners, power users, administrators and developers. And with many customers and the press asking if there is room for Notes in the age of the World-Wide Web, Lotus has woven Notes and the Internet into an integrated solution.

Additionally, Lotus has increased both hardware and operating system support to provide the ability to easily create and deploy cross-platform applications between RISC and CISC architectures running Unix, OS/2 or 32-bit Microsoft Windows operating systems.

After using the product for several months, we boiled down the hundreds of new features of Release 4 into four categories: usability, administration, connectivity and application development.

**Usability**

The tabbed workpage desktop of Release 3 is still in place. In a database, however, changes are more visible (see Figure 1).

Database windows are now split into two panes for easier viewing — the left pane details the folders and design of the database, and the right pane lists the selected database documents. A third pane that provides a document preview can be added at the bottom of the window.

Navigation with this new design is fairly intuitive, but you should not be under the impression that this is a "no-training" upgrade. Plan on at least a day for the basics. After the proper training, the new interface should lower end-user support requirements.

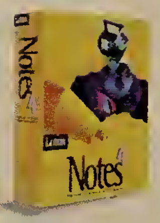
New to Release 4 are database folders, which users can create on the fly to promote easy organization of database contents. Folders are an enhancement to Release 3's categories, which can still be used in Release 4. Unlike categories, however, a folder will remain even if it is empty.

Release 4 also lets users customize views on the fly based on rights given by the developer. They may be able to slide a column width back and forth, for instance, without having designer-level access to the database.

The switch to folders and panes fulfills a key Lotus goal: a homogeneous inter-

*See* **Lotus**, *page 52*

## NetResults



**Product**
Notes Release 4

**Vendor**
Lotus Development Corp.
(800) 346-1305, (617) 577-8500

**Price**
- $495 for single-processor server
- $2,295 for multiprocessor server
- $55 for Notes Mail client
- $69 for Notes Desktop client
- $275 for Notes Desktop client plus application development

**Pros**
- Increased performance and scalability
- Excellent Release 3 to Release 4 migration path
- LotusScript is a welcome addition to @formulas
- Internet access is a windfall

**Cons**
- Server console window still text-based and hard to read
- Potentially steep learning curve for average users

face for Notes Mail and cc:Mail. Users of cc:Mail can jump right into Notes Mail, taking advantage of its client/server technology.

Next on the usability hit list is the introduction of agents, which are similar to macros but offer far greater usability and flexibility. Without learning the Notes programming languages, users can employ a relatively simple interface to create agents that automate many tasks, from searching databases on servers to deleting mail messages from a specified user.

There are several canned agents available for common tasks. One of our particular favorites is the "out-to-lunch" message — a customized outgoing mail message generated for all new mail received. Of course, the agent can be modified, so a message from the boss might get a separate canned — and reverential — response.

Composing mail messages is also easier, thanks to an enhanced text editor. The right mouse button is employed extensively, along with icons and action bars.

Action bars contain context-sensitive buttons for commonly used tasks, like creating a response in a discussion database. Unlike Release 3's buttons, which were available only in Notes forms, action bars are available in both forms and views.

Adding comments to a document is also a dream, thanks to the permanent pen. It allows users to add comments to existing text in a predefined color and font at any point in the text. Marking up a document in Release 3 required many visits to the Text/ Font menu to manually change the appearance of each comment.

The Replication interface — the bread and butter of the Notes client/server engine — also has been much improved. Release 4 introduces the Replication Workpage, located on the desktop as a workspace tab. While users still have the ability to selectively replicate databases, the Replication Workpage graphically summarizes all of a user's replication options (see Figure 2).

## Release 3-to-Release 4 migration

**After a thorough analysis of the new product, we wistfully pondered how easy things would be to start fresh at Release 4 rather than dealing with a migration from Release 3. But since that is mere fantasy for many, Lotus Development Corp. has provided tools for easing the transition.**

**To stage the upgrade process, Release 3 clients are fully compatible with Release 4 servers (but not the other way around). This allows you to first upgrade the servers, work out any kinks and get comfortable in the brave new world that is Release 4. Release 3 and Release 4 servers can also coexist, so don't rush to upgrade the entire server infrastructure overnight.**

**A Release 4 database cannot, by default, be used by Release 3 clients or servers. To ensure backward compatibility between the two, Lotus has created an NS3 file format that allows Release 3 clients to access a database. You can give clients and servers a means for accessing databases created in a Release 4 environment by saving the database with the NS3 extensions.**

**To give users a helping hand in the new environment, Release 4's Help menu includes a Release 3 menu bar. If you select a Release 3 menu item, a text window will point the way to the analogous Release 4 command.**

**Perhaps the most widely used Notes databases are personal mail databases, so bringing them gracefully into the Release 4 world is in everyone's best interest. Release 4 provides a mail conversion utility for these databases that, among other things, converts existing mail categories into folders, creates an in-box for new messages and adds action bars and agents.**

**The Notes API from Release 3 is fully compatible with Release 4, according to Lotus. This means that any applications you developed for Release 3 are supported under Release 4.**

**While recompiling a Notes API program for Release 4 is possible, you should not do it until all clients and servers have been upgraded to Release 4. Recompiling under Release 4 renders the program unusable to Release 3 clients or servers, but permits users to take advantage of the increased performance and functionality of the new version.**

**For many organizations the Notes upgrade will not be the only decision on the plate. Most Notes servers still run under OS/2, as OS/2 was the first operating system supported by Notes. With the full-throttle commercial press of Windows NT, or the raw power of a RISC/Unix speedster, you should take the time to consider if a Notes upgrade is only a piece in a larger puzzle.**

**– Steven Goldberg**

A user can see how each database is to be replicated and the status of a replication in progress.

Replication options have also been improved. In Release 4, replication occurs at the database field level. In Release 3, a change to any field in a document resulted in the replication of the entire document. Selective replication is also more powerful, allowing users to graphically select a subset of documents to replicate.

For the road warrior, these changes can result in major time and money savings as the length of a dial-up call is now reduced.

Users with crowded Notes desktops will be pleased with the ability to "stack" Notes database icons. In Release 3, each database replica required its own icon. Release 4 presents a single icon with an arrow in the upper left corner. Clicking on the arrow presents a list of available locations for the given database; local and server-based replicas of a user's mail database now occupy one desktop icon. The result is a much less cluttered Notes desktop.

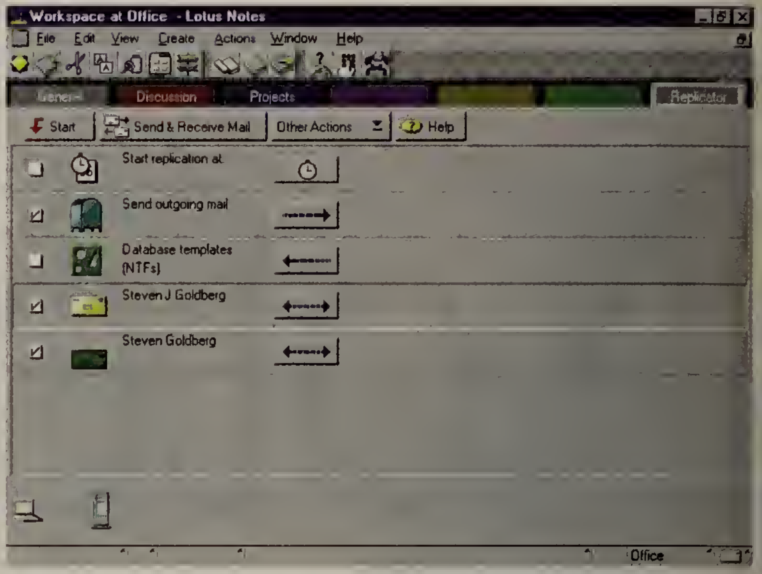


**Figure 2:** *The new client Replicator Workpage lets you set all replication details and preferences, and displays replication process status.*

### Admin heaven, sort of

Managing large Notes networks still isn't fun, but Release 4 makes a valiant effort to ease the administrative burden. Release 4 is a true multithreaded 32-bit workhorse. Lotus designed it to take advantage of as many as six processors per server, claiming 1,000% performance gains over Release 3. Lotus now claims to support up to 500 active Notes sessions for a single-processor server (see graphic, page 53), though we did not attempt this in our lab.

Server replication is also aided by symmetric multiprocessing, as multiple replication processes can be activated concurrently. Our test machine, however, was a uniprocessor box.

In addition to scalability and performance improvements, Lotus addresses day-to-day administration of Notes networks with a variety of new tools and features. Most of the features are centered around the newly introduced Administrator Control Panel, which gives an administrator centralized access to all servers in a Notes network. User and group administration, address book updates, certification additions and changes, and database maintenance are some of the functions that can be administered via the Administrator Control Panel.

NetworkWorld Fusion
http://www.nwfusion.com
See what Notes users have been saying on Usenet about the new version. Select NetRef, Buyer's Guides and Reviews, then Notes Release 4.

Release 4 fixes several Release 3 administrative shortcomings — the first being Access Control List (ACL) maintenance. ACLs define who can access a database and in what capacity. Propagating and enforcing ACLs in Release 3 was nightmarish in large organizations. Release 4's graphical approach greatly simplifies the process, with the addition of an ACL agent that synchronizes changes between the Name and Address Book and ACL. In Release 3, ACL changes made in the Name and Address Book are not automatically propagated to databases, so they are not necessarily accurate.

In Release 3, anyone with access to a local database could read the data in it, despite any ACLs that would prevent this on a Notes server. In Release 4, this major security leak has been plugged, as ACLs can now be enforced at the local level.

To further increase security, an administrator, designer or user can disable the ability to forward, print or copy a document to the clipboard. Forwarding a secure document in Release 3 was as easy as performing a cut-and-paste. Users now can have the confidence that a "for your eyes only" message stays that way.

For the nervous administrator constantly monitoring low disk space on a Notes server, Release 4 introduces the Single Copy Object Store, a longtime feature of cc:Mail. As the name implies, a Single Copy Object Store keeps just one central copy of a message sent to multiple people on a server, rather than sending entire duplicate files as in earlier releases.

Database administration has also been cleaned up. In Release 3, gathering statistics about a particular database meant adding it to your workspace, performing the analysis and viewing a log file.

This has been consolidated with the Database Analysis Tool, making it easier to examine a database and any or all of its replicas without touching the workspace. As a result, log files can be centralized for easier viewing and analysis.

Release 4 databases now can be up to 4G bytes, up from the 1G byte limit of Release 3. And you now can put a cap on the maximum size of a database, providing a proactive method for ensuring low

### Recommended active sessions by network protocol

| | TCP/IP | IPX/SPX | NETBIOS | VINES | AppleTalk | XPC |
|---|---|---|---|---|---|---|
| **OS/2** | 500 | 500 | 255 | 50 | 50 | 32 ports |
| **Win95** | 500 | 500 | 255 | 500 | NA | 32 ports |
| **Windows NT** | 500 | 500 | 255 | 500 | 500 | 32 ports |
| **Solaris** | 500 | 500 | NA | NA | NA | 32 ports |
| **HP-UX** | 500 | 500 | NA | NA | NA | 32 ports |
| **AIX** | 500 | 500 | NA | NA | NA | 32 ports |

NA = not available

disk space nightmares. But plan on a server with copious amounts of disk space. Notes requires 120M bytes for server installation, and at least 30M bytes for the client — and that's without any databases.

**Connectivity**

At its core, Notes is a connectivity and communications engine. Release 4 enhances this underlying architecture in several important ways, including both Internet and E-mail integration. The result is a more cohesive, platform-independent environment.

Release 4 provides a host of Internet connectivity options for organizations of all sizes. It gives users Web, FTP and newsgroup access from the comfort of their Notes workspace.

Notes databases can be automatically converted to HTML for access from the Web; external Web sites can be converted to Notes databases for internal use. And while they were at it, the Notes developers added the ability to replicate with other Notes servers across the Internet as certified or anonymous clients.

For those of you looking to offer Web access to clients, Release 4's InterNotes Server is a blessing for many reasons. Initial setup is a breeze. We were up and running in our test environment in 15 minutes.

## HOW WE DID IT

Our test network consisted of a Dell Dimension P60 with 16M bytes of RAM. The system was running Windows NT 3.51 and the final beta Test Build 3 of Release 4 Notes Server. The server was running NETBIOS/NETBEUI, TCP/IP for Internet access and XPC for dial-up communications.

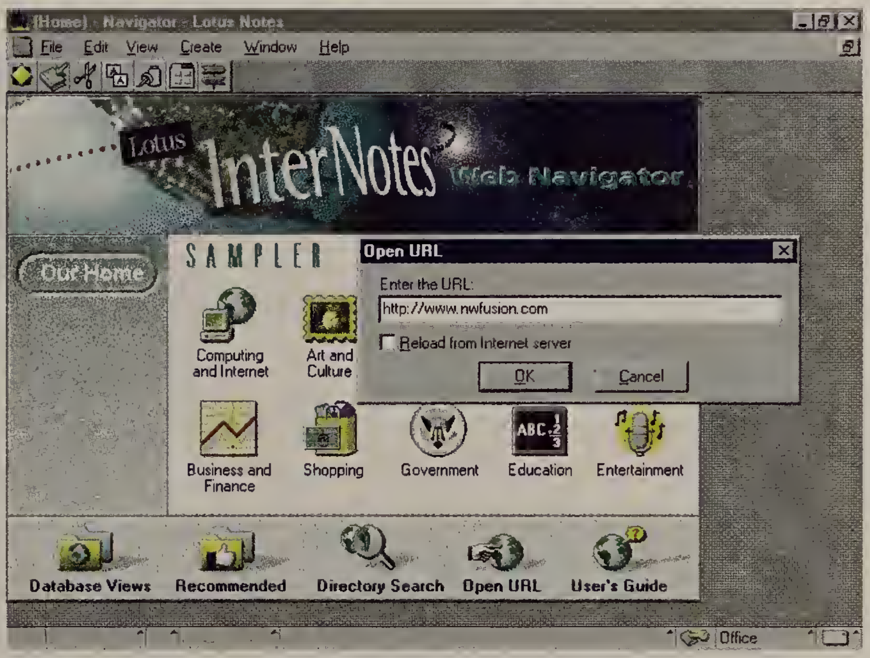
Our client was a 75-MHz AT&T Globalyst 200 486 laptop with 12M bytes of memory, running Windows 95.

The client communicated with the server via NETBIOS/NETBEUI on the network, and XPC for dial-up communications.

We replicated via the network and via dial-up. We also used the new document library template to route, edit and approve documents.

All that is required is to load a process on the server and create a Notes database from a standard Release 4 template. Users access this database as any other, and are presented with a home page bitmap (see Figure 3). TCP/IP need only be installed on the server and enabled under Notes; it's not required on the client. Our test client accessed the server via NETBEUI and the Notes server routed the requests to the Notes TCP/IP port.

That means organizations with a "traditional" Windows 3.1 and IPX/SPX operating environment don't need to purchase, install and support TCP/IP client licenses or server gateways and Web browsers. And since Notes supports dial-up usage, remote Notes users get remote access to the Internet. All the infrastructural impact is on the back end rather than on the user desktop.



Open URL

Enter the URL: http://www.nwfusion.com

☐ Reload from Internet server

OK Cancel

**Figure 3:** *The InterNotes client accesses the Web through a Release 4 server. Notes databases can also be viewed by Web browsers.*

Prior to Release 4, a Simple Mail Transfer Protocol mail gateway was an optional add-on product.

Release 4 incorporates the SMTP message transport agent into the server kit. This gateway can be used internally to communicate with a secondary mail system or directly to the Internet.

Lotus also has added support for Microsoft's Messaging API and the X.400 API Association's Common Mail Calls mail clients, in addition to its own Vendor Independent Messaging. Among other clients, Notes can now directly support the Exchange client that ships with Windows 95. We easily set up Microsoft Exchange on our Windows 95 client to send and receive Notes mail.

And finally, the icing on the connectivity cake: Release 4 supports server pass-through for dial-up communication. Imagine you are on the road and you download your E-mail.

There's a message containing three hypertext links. Unfortunately, each link connects to a document on a different server. Even if you had all the phone numbers for the other servers, under Release 3, it takes slightly longer than forever to navigate through the message as you connect and drop from the individual servers.

Server pass-through allows a user to dial in to a single server and connect to all accessible servers on the Notes network, providing single phone number access to the entire environment.

Pass-through can be used for network-based users running different protocols, as was the case for our InterNotes access testing. Because we were running in a single Notes server environment, we were not able to take advantage of the new feature.

**Application development and workflow**

One of the most notable shortcomings of previous versions of Notes was the rudimentary "programming" language. These simple "@formulas" were a carryover from the Lotus 1-2-3 spreadsheet world, rather than a serious attempt at a structured and useful programming language.

The @formulas, still supported and enhanced in Release 4, are confusing and frustrating at best.

This lack of an embedded Notes scripting language forced you to rely on the Notes API. While the Notes API provides the programming muscle that serious workgroup application development requires, it was platform-specific. Notes API code developed for OS/2, for instance, would have to be recompiled when ported to one of the Unix variants.

While complex applications still may require the Notes API, Lotus has integrated LotusScript, a BASIC-like scripting language, into Release 4. LotusScript allows you to automate processes and integrate data from Open Database Connectivity-compatible databases.

Developing Notes applications in Release 4 bears little resemblance to previous versions. In Release 3, developers were confronted with a trial-and-error database design method. After making a change, they had to save it, exit from the design function and then test the change.

Release 4 tightly integrates the design process with its own multipaned development approach.

Changes can be entered in one pane and immediately tested in debug mode in another. A floating properties box can be used to gain detailed information about the database and its design.

The design of Notes databases has also been enhanced. Release 4 adds support for multiple lines in database views, rather than the truncated text of Release 3. A developer also can guide users through a series of icons or bitmap images, rather than the standard text navigation.

For instance, a map might be more inviting than a list of cities organized by sales territory. Notes also supports Microsoft's OLE 2.0 as a client and server application. Information can flow between Windows applications and Notes documents and fields.

As more applications become OLE 2.0-compliant, Notes can be used as the workflow tool to store and route information from various sources.

Release 4 also has made workflow capabilities easier to understand and develop. One of the new standard database templates — the document library — provides a canned workflow application that can be used in many applications. Users can easily select how a document is to be routed throughout a workgroup or an entire organization, and can follow its progress along its journey.

In our test Notes network, we set up a document to route to three Notes users. After selecting how to route the document, serially in this case, we selected users from the public Name and Address Book.

After the document passed through each reviewer's hands, the document author was notified that the process had completed. This simple automation is adequate for probably half the paper that crosses our desk each day. For more complex needs, the overall methods for designing workflow applications have been improved.

**Not to go on . . .**

At the risk of sounding overenthusiastic, we love Notes Release 4. It can play a role in most organizations, and now packs the power and features to give it true credence. While creating and supporting a Notes environment is still a challenge, we believe the product's cost-of-ownership is now justifiable as it begins to automate an expanding range of business processes.■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 41.

*Goldberg is manager of a desktop standards and architecture group for a Big Six accounting firm. He can be reached at sgoldberg@vax.clarku.edu.*

# ComNet '96 Preview

**A Special Preview Section for Network Decision Makers**

*Anyone can go to a big trade show and come back with a gloss on what's hot, what's hyped and what's happenin'. But with a little planning, you can turn ComNet '96 into so much more — a working experience actually enabling you to PERFORM as a network manager.*

*You'll be better prepared to put out bids, make buying decisions, and optimize your LANs and WANs — all while staying, as the old commercial said, "just slightly ahead of our time."*

*What follow are our picks for maximizing your time in Washington, D.C. at ComNet '96.*

## ATM GROUP MEETING

The Southeast Region ATM Interest Group will hold its first meeting of 1996 in the Renaissance Hotel on Jan. 31 from 8:30 to 4:00 in Washington, D.C.

The group will discuss ATM standards and provide an update as to where the key components stand in the ATM Forum. The idea is to let everyone know what's working and what isn't, said Nancy Agosta, president of the group.

The user perspective will be presented by a member of a Nortel internal working group that is building an ATM network. There will also be a presentation on the federal government's plans for ATM.

Separately, the American Research Group will make a presentation on ATM LAN emulation.

The interest group takes away issues, concerns, comments and other data gathered from this meeting back to the ATM Forum, so your attendance could make things happen.

For more information, call Agosta at (919) 248-1196.

## *January 29 and 30*

*Our picks*

**Tuesday, 2:30 to 3:30 p.m.**

*Advanced Wide-Area Collaborative Computing Environments*

The spotlight speaker for this event is Rick Stevens, division director, mathematics and computer science, Argonne National Laboratory. Stevens is one of the leaders of the I-Way, an experimental grid spearheaded by the Argonne National Laboratory to link supercomputer centers, government facilities — and potentially corporate networks — over OC-3 ATM links.

He will describe how I-Way uses Magellan ATM switches from Northern Telecom, Inc. and other gear to push bandwidth-intensive collaborative applications across the wide area with low latency.

Attendees will also learn how the network utilizes digital media servers and mass storage capabilities to keep the gigabits flowing.

Pick of the DAY

**KEYNOTE**

**Evolving the Internet into the Networking Decade**
**Eric Schmidt, chief technology officer, Sun Microsystems, Inc.**

**Tuesday, 1:00 to 2:00 p.m.**

Schmidt will bring the Internet phenomenon into perspective for corporate network managers by analyzing the 'Net's potential effect on digital cash, interactive catalogs, videoconferencing and electronic purchase orders. He also will examine the state of the Internet with regard to accessibility, security and interactivity.

**Monday and Tuesday**

ComNet's tutorials are not just for beginners. This year, they offer several opportunities for you to identify and assess all the buying criteria for hardware, software, carrier-service and management-systems purchases.

We recommend:

**Monday, 9 a.m. to 5 p.m.**

*Remote LAN Access: Delivering the Remote Office*

Charles Okwudiafor, engineering program manager at Network General Campus Corp., will review hardware, protocols, wire-line and wireless WAN connections, and case studies.

**Tuesday, 8:30 a.m. to 4:30 p.m.**

*Rearchitecting Campus Networks Using LAN Switches and Desktop ATM*

Kevin Tolly, president of The Tolly Group, will assess the products now shipping and their impact on network design, workgroups and your budget.

**Tuesday, 8:30 a.m. to 4:30 p.m.**

*The Priciples of Network Management*

Jill Huntington-Lee, principal analyst of Brandywine Networks Associates, and Steve Morganthal, vice president of Unified System Solutions, will present case studies, discuss cost justifications and talk about how to develop a management architecture.

## *January 31*

*Our picks*

**8 to 9 a.m.**

*Introduction to the Real World of ATM Networks: The Essential Survival Guide for Non-Thrill Seekers*

Pioneering Asynchronous Transfer Mode users are slated to describe their first experiences with ATM. The group is also expected to detail the impact of standards on implementing an ATM net today and the business justification for deploying it.

Users expected to share experiences are David Beering, senior staff telecommunications analyst with Amoco Corp.; Chuck Rush, global network manager for McDonald's Corp.; and John Hatton, director of engineering for Burlington Northern Railroad.

**9:15 to 10:15 a.m.**

Keynote: *James Barksdale, president and CEO of Netscape Communications Corp.*

Making his third appearance at ComNet, Barksdale will focus on the security of the Internet. More companies want to do business electronically, but is the 'Net secure enough? Barksdale will present the issues and offer some solutions. Other topics will include a discussion of the Internet's growth and the impact it will have on future business operations.

**10:30 a.m. to 12 p.m.**

*Frame Relay Switched Virtual Circuits: Unnecessary or Inevitable?*

Do you need SVCs? What would they be used for? How fast will frame relay implement SVCs or alternatives, such as dial-up access, to further extend to the borders of enterprise and multienterprise WANs? A panel of experts, including Steven Taylor, chairman of Distributed Networking Associates, Inc., will examine the issues.

**2:30 to 5:30 p.m.**

Group Meeting: *CableLabs/IT Convergence Forum*

The CableLabs' first group meeting of the year will focus on gaining industry support for the development and delivery of high-speed services on cable networks.

Note that a Feb. 1 session titled The Next Frontier in Broadband Networking: Information Technology Meets the Cable Industry would also be of interest to anyone following the challenges the cable industry faces bringing services to the business world. Cisco Systems, Inc. and Digital Equipment Corp. representatives are expected to present their views.

**1:45 p.m.**

*Doing Business On-Line: How to Read the Signs Along the I-Way*

Four champions of electronic commerce will discuss and demonstrate their applications, focusing on marketing, security, design and other issues.

The session will be moderated by Frank Henderson of the NetPlex Group and will feature Joe Forgione, senior director of the

AT&T Network Notes initiative at Lotus Development Corp.

**5:15 p.m.**

*Understanding VLAN Alternatives*

It all sounds great, but without standards, how can you put the various virtual LAN schemes to work in your enterprise? Fred McClimans, principal and cofounder of Decisys, Inc., will walk you through the options.

**6:15 to 7:45 p.m.**

**Birds of a Feather:** *Token-ring Switching Study*

The Tolly Group will present the results of a token-ring switching study the firm recently completed. Performance, features and functions of token-ring products from 3Com Corp., IBM, Cisco Systems, Inc. and others were evaluated in the study.

Kevin Tolly, president of The Tolly Group, said the study should help network managers make intelligent decisions about purchasing 16M bit/sec token-ring products.

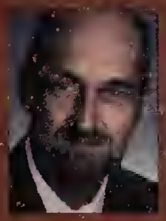
Pick of the DAY

## SHORT COURSE

**Evaluating High-Speed LAN Alternatives: Planning, Designing and Implementing Switching Technologies**

**Jim Metzler, director of consulting services, Strategic Networks Consulting, Inc.**

**9:15 a.m. to 12:15 p.m.**



Metzler will begin this soup-to-nuts evaluation by reviewing the desktop, workgroup and enterprise classes of LAN switches. He will describe the similarities and differences among the major switching products, and recommend how to plan, design and implement a switched network for better efficiency. Metzler's report will be based on a series of evaluations by Strategic Networks Consulting and the Harvard Network Device Test Lab.

## February 1

*Our picks*

**8 to 9 a.m.**

*Distributed Management: RMON and Beyond*

Managing distributed networks is quickly becoming a network manager's nightmare. This panel discussion is designed to focus on what's out there to help you do your job. The session will focus on what's available in the standards-based world and how Remote Monitoring technology can help managers run their daily operations more smoothly. John McConnell, president of McConnell Consulting, Inc., will lead the group discussion.

**12:45 to 1:45 p.m.**

*Update—ATM: Reality in 1996*

Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy, intends to cut through the hype surrounding ATM. He will look at implementation concerns and costs surrounding the deployment of ATM products and services.

**1:15 to 4:15 p.m.**

**Short Course:** *Protecting Your Assets: Enterprise Network Security Policy from Assessment to Implementation*

Do you take security seriously? These panelists do because they have to. In this intensive session, they will identify and present solutions to the biggest threats to corporate networks, not just those that get the most publicity. Featuring Michelle Crabb, computer security analyst for NASA Ames Research Center; Jeff Schiller, a network manager at the Massachusetts Institute of Technology; and Marcus Ranum, principal of Warehouse, Inc.

**3:45 to 5:15 p.m.**

*Integrating Management Systems*

Attendees will get a look at how object-oriented management platforms can help them get a better handle on managing multivendor network devices. David Passmore, president of Decisys, Inc., will also look at how leading management platforms can be made to work together for a unified view of the enterprise.

Pick of the DAY

## USER CASE STUDIES

**Global Implementation of a VPN**

**8 to 9 a.m.**

Thousands of corporations have domestic virtual private networks (VPN). Many also have bilateral VPNs where routing and reporting features are shared among sites in two countries. But can you obtain a true global VPN mapped to sites in many different countries? Three customers in various stages of global VPN implementations will give a real-world baseline. The session will feature Sam Shiels, director of worldwide telecommunications for SmithKline Beecham, Inc., along with top officials of Ernst & Young and Bankers Trust Co. The session will be moderated by Ned Feldman, corporate voice product manager at Sprint International.

## TALKIN' ABOUT TELECOM REFORM

Even if Congress enacts a new telecommunications law, it will probably require the Federal Communications Commission to do a lot of work before the impact of the bill is felt by telecommunications customers.

Is this the best way to bring full competition to all sectors of the public network? Are users best served by an activist FCC closely regulating monopoly carriers? Or is it better to have an immediately deregulated marketplace where all carriers fend for themselves?

You can express your views and hear from others about this key subject at the ComNet Town Meeting from 4 to 5:30 p.m. on Wednesday. The meeting will be moderated by Richard Wiley, senior partner of Wiley, Rein & Fielding.

Panelists will include FCC General Counsel William Kennard; former FCC Commissioner Henry Rivera; Larry Irving, head of the National Telecommunications and Information Administration; Peter Huber, senior fellow at the Manhattan Institute; and carrier lobbyists, including former Congressman Tom Tauke, now NYNEX Corp.'s top man in Washington.

They'll let you in on what the enormous, 238-page (and counting) telecommunications bill really says on such issues as local-loop competition, network interconnection, carrier-rate regulation and long-distance entry by RBOCs.

For predictions on the ultimate outcome of the congressional effort to finally deliver a bill to the president's desk, you can attend ComNet's traditional "crystal ball" session on Wednesday from 10:30 a.m. until noon. It will feature top staff members from the House, Senate and White House.

## LIVENET DISCUSSION

If your enterprise network consists of a wide mix of LAN and WAN technologies, you might want to visit ComNet's model corporate network, which will provide lessons in interoperability.

You won't have to run all over the trade show to check out the network since LiveNet is accessible through an enclosed section on the second floor of the convention center.

LiveNet features a network control center, plus five departments of a model corporation — accounting, marketing, R&D, engineering and a simulated factory floor.

Each department is connected to the network backbone through different technologies — Ethernet for accounting, FDDI for marketing and R&D, ATM for engineering, and wireless data for the assembly line.

The backbone includes both traditional FDDI and a 100M bit/sec copper-wire version running over twisted-pair/physical media dependent.

Protocols throughout the network include both IPX and TCP/IP working with a mix of PC and network operating systems — including NetWare, OS/2, Unix, Solaris and Macintosh.

A set of terminals in the marketing department of the model corporation represents remote wide-area access to the backbone by dialing out to the public switched network.

In addition, several booths on the trade show floor provide wide-area access over frame relay, Switched Multimegabit Data Service and other technologies.

By the way, the LiveNet model corporation makes 3-D glasses. You'll find out how that plays a part in the LiveNet demo when you visit it.

## MICROSOFT CONSULTING SERVICES

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At Microsoft, we believe one idea can have an enormous impact—and one person can create a world of change. Today, as business data continues to migrate off the mainframe and into client/server architectures, our Consultants are working with key decision makers at Fortune 500 companies to provide them with some of the industry's most sophisticated solutions. With virtually unparalleled resources at their disposal, including access to the most powerful technologies available, they drive acceptance of Microsoft products and technical solutions.

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**NETWORK ARCHITECTURE:** Requires strong large scale LAN architectural experience with NT™ Server, Windows® for Workgroups, LAN Manager or other advanced network OS. Knowledge of Systems Management Server, TCP/IP, gateways, bridges, routers, network diagnostic tools, mail/messaging systems, RDBMS and GUI applications development preferred.

**MESSAGING ARCHITECTURE:** Requires demonstrated experience in the design/implementation of large mail/messaging systems; multi-platform integration; and strong knowledge of Microsoft Mail/Exchange or other advanced mail/messaging systems. Experience with LAN architecture, messaging standards/protocols/gateways such as X.400, X.500 and/or SMTP, MAPI and RDBMS design and development preferred.

**WINDOWS APPLICATION DEVELOPMENT:** Requires strong Windows/Windows NT/Windows 95 development experience using C/SDK, C++, Visual C++™/MFC and/or Visual Basic®, and demonstrated GUI application design and development experience. OLE, RDBMS and/or LAN design/implementation preferred.

**DATABASE DEVELOPMENT:** Requires significant logical and physical design experience with SQL Server/other advanced RDBMS. Knowledge of database performance tuning, OLE, ODBC, network architecture and GUI application development preferred.

**CONSULTING MANAGEMENT:** Requires management of large scale projects/consulting staff members and client/server business development. Client/server based development experience and knowledge of Microsoft products/architectural strategies strongly preferred.

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NETWORK MANAGEMENT - architecture, design & implementation of network mgmnt systems including distributed polling/processing, alarm correlation, performance monitoring and reporting. Exp w/HPOV, Netview, Spectrum, Sun Net utilizing RMON & SNMP.

NETWORK OPERATIONS - network control center support and troubleshooting for global, frame relay and multi-protocol WANs. Experience in rapid detection and resolution of transmission circuits and equipment (routers) problems via SNMP management platform. Previous Level 1, 2 or 3 required. International carrier/PTT experience a plus.

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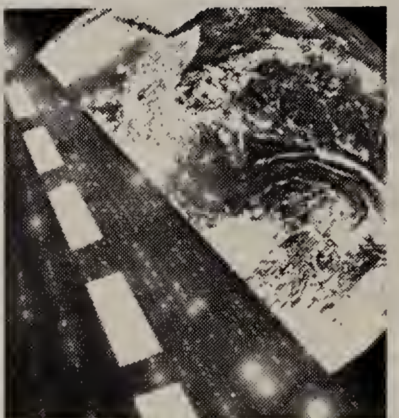

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*Network Support Expert* - For this senior-level position, we seek a highly motivated network technologist with expert skills and extensive experience related to Frame Relay, Cisco routers, Ethernet and Token Ring. Solid network troubleshooting and support experience with routing and hub technologies in a multi-protocol WAN/LAN environment is required. Other necessary skills include expertise in Sniffer, packet decoding, RIP/SAP filtering, TCP/IP, IPX and SNMP, and proven project management abilities. Background in DNS, large modem pools, use of SNMP-based network management, and switching technology is preferred. Job Code NSE

*Network Support Technologist* - For this important support role, we seek a network technologist with solid problem diagnosis and resolution skills, background using tools such as Spectrum and Distributed Sniffer to identify, analyze and resolve network problems, and ability to work in a fast-paced, team-oriented environment. Experience with TCP/IP and IPX in Token Ring and Ethernet environments is required. Background supporting Cisco routers and Cabletron hubs, as well as NetWare 3.11 and NT experience, are preferred. Working with other network operations staff, this individual will have responsibility for production support of our entire network infrastructure. Job Code: NST

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### *COMPANY BACKGROUND*

* Venture funded entrepreneurial company
* Headquarters in Silicon Valley, R&D in Sarasota, FL and CA
* ATM, Frame Relay, ISDN, Internet access equipment company
* Customers: Telco Carriers, Internet Service Providers, Enterprise Networks
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### *OPPORTUNITIES*

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ISDN internet access protocols for ATM switch. Q.931 Signaling, BRI/PRI, PPP RADIUS / CHAP / PAP. Background in Frame Relay/ATM/SNMP is useful.

#### Lead Software Engineer - IP Routing

IP Routing protocol software for ATM switch. OSPF /RIP /BGP/IS-IS. Frame Relay, ATM, SNMP background is useful.

#### Software Engineer - Embedded Software

Interface with state-of-the-art communications chipsets. ATM/SONET/DS3/DS1/IP/ISDN. Experience with real-time embedded kernels. Frame Relay/ATM/ISDN/SONET/DS3/DS1/SNMP useful.

#### Software Engineer - ATM/FR Routing & Signaling

Experience in ATM connection management, ATM Routing and Signaling, Frame Relay/ATM Internetworking, FR Signaling, Congestion Management. Routing experience in data packet networks, LAN interfaces, X.25 desirable. CASE tools including ClearCase, ObjectTime, Imake/Make. MSCS/MSEE - +3 yrs. Extensive embedded real-time software experience with VxWorks, i960, C. SmallTalk background a plus.

#### Lead Hardware Engineer

Card level logic design experience. Strong architecture and technical leadership avility. Experience with VHDL/FPGA/ASIC/embedded processors. Networking/ATM/FR/ISDN a plus. Viewlogic, Altera a plus.

#### Hardware Engineer

Experience with use of VHDL, FPGAs, ASICs. Experience with ISDN hardware, data compression, MP/BONDINGa big plus. Hardware based implementation of IP Routing/Packet Forwarding a plus.

### *PLEASE CONTACT:*

Jeffrey Price, Director, Software Engineering email: price@cellstream.com
FAX: (941) 371-5532 MAIL: 2201 Cantu Ct., Suite 205, Sarasota, FL 34232

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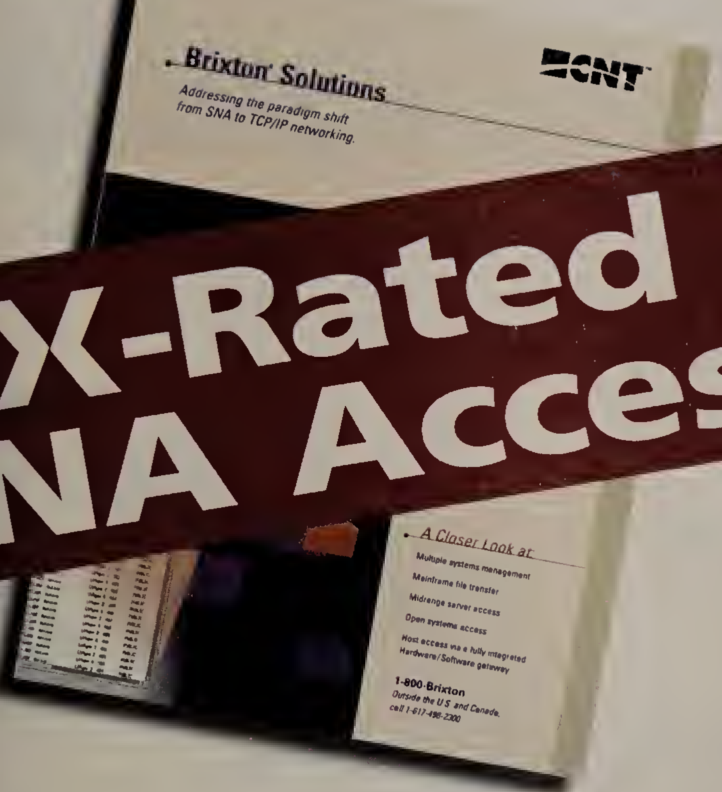
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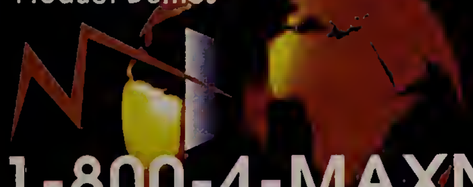

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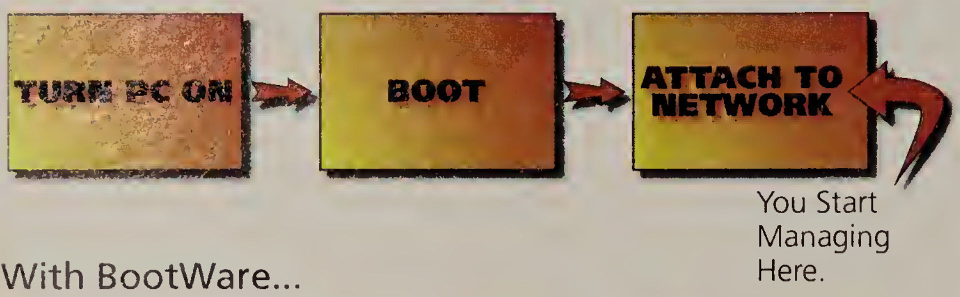

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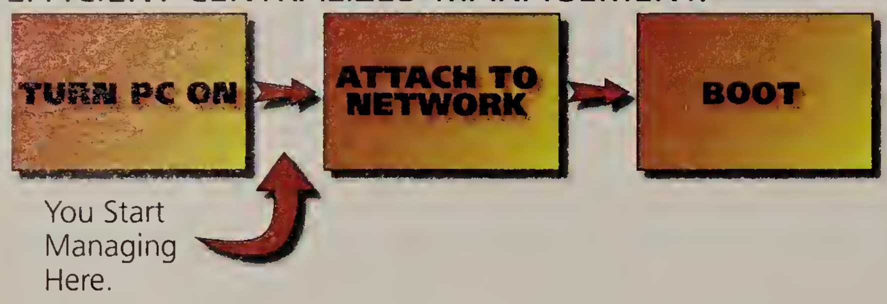

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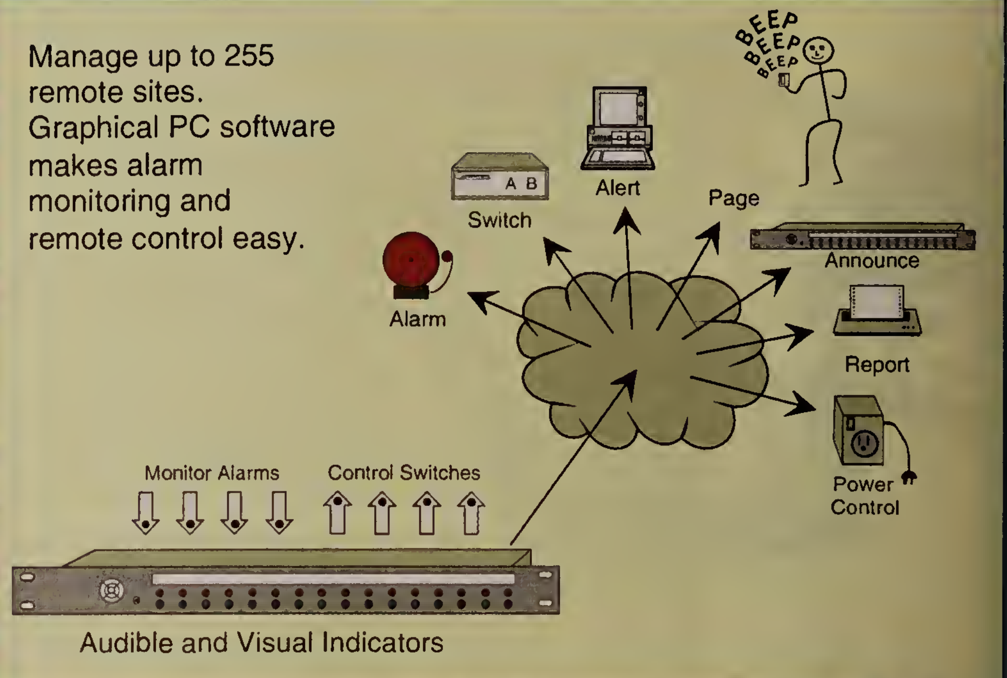

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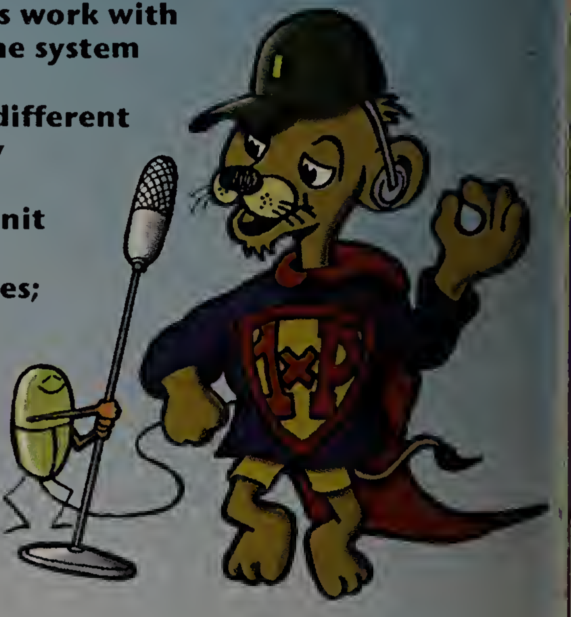

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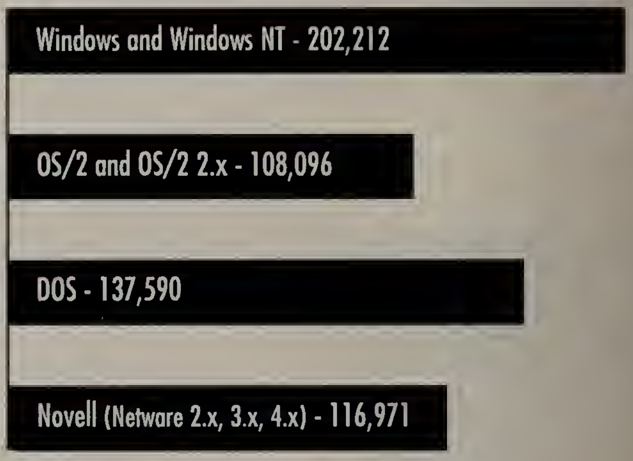

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## Multimedia

*Continued from page 1*

ware, Inc., and its first set of software. Sources said the Windows-based tools are designed to let companies run audio and video traffic across packet-based LANs and WANs — including the Internet — to support applications such as corporate communications, computer-based training and desktop videoconferencing.

**Judy Estrin,** *with Bill Carrico, this week will introduce Precept Software, Inc.*

The IETF standards-based software overcomes the basic inability of packet-switched networks to handle delay-sensitive multimedia traffic through the support of standards that ensure quality of service and provide feedback on network conditions before traffic is sent across the net.

The start-up initially will offer two main products: FlashWare, a set of transport services, and IP/TV, a collection of applications to take advantage of those services.

FlashWare has two components: Real-Time Transport Services and Multimedia Services.

The transport services packetize data and send it over the network via a WinSock-compliant TCP/IP stack. This is done in real time via the IETF Real-Time Transport Protocol.

The software also ensures that the network path is clear of interference and that multimedia traffic gets priority over less deterministic traffic. Precept's Multimedia Services run atop the transport services to compress, decompress and synchronize the data.

Precept will offer its own FlashStack TCP/IP stack optimized for multimedia traffic, but any WinSock-compliant stack will do.

### Channel surfing

Customers can exploit FlashWare's services by running Precept's IP/TV application suite, which supports the transmission of live or prerecorded audio and video to desktops via IP nets. The software supports IP Multicasting, which conserves network bandwidth by enabling video and audio feeds to be sent to a predefined group of endstations simultaneously, rather than to individual endstations one at a time.

The software delivers full-motion video on a user's PC without dedicated video cables, boards or monitors. IP/TV will run on any Video for Windows-compatible hardware.

IP/TV components include a program guide that is designed for scheduling and managing multimedia sessions, and is accessible via a Web browser; a server that delivers programs listed in the guide; and a viewer that lets end users see what programs are available.

Users were enthusiastic about the new products.

"Even if ATM is a panacea, most companies will not be able to change out [their networking technology] very quickly," said Kevin Walsh, network specialist at the University of California, San Diego, which has developed multimedia courseware. Technologies that work with current nets as well as ATM are key, he said.

Precept is not the first company to tackle sending multimedia traffic over existing nets. Syzygy Communications, Inc., recently acquired by NetManage, Inc., offers products in the same space called the Network Quality of Service Solution. The products are set to ship this summer.

Industry observers said multimedia-over-IP technology is promising but will require broad industry support from networking equipment vendors.

"In order to get any of this to work, you have to get the router vendors to play ball because it's the routers that reserve bandwidth," said David Cowan, an associate at Bessemer Venture Partners, an investment firm in San Francisco. "[The products whose supported protocols] get buy-in from companies like Cisco and Bay will be able to deliver high-quality multimedia services within the enterprise and eventually over the Internet."

FlashWare will be available in March for Windows 3.1, and in the second quarter for Windows 95 and NT.

Pricing is $249 for the client and $399 for the server. IP/TV bundled with FlashWare costs $349 per client and $1,499 per server. It will ship in April.

☏ Precept: (408) 446-7600.

**PRECEPT**
SOFTWARE INC.

| | |
|---|---|
| **Founded:** | March 1995 |
| **Management:** | Bill Carrico, chairman; Judy Estrin, president and CEO |
| **Primary products:** | FlashWare software that enables LANs and WANs to handle real-time multimedia traffic; IP/TV application for distributing audio and video over packet-switched networks. |
| **Financials:** | Privately held; received $900,000 in first-round funding and about $5.5 million in second-round funding. |
| **Employees:** | 15 |

## Informix

*Continued from page 6*

while, Sybase, Inc. has reportedly diverted its attention away from such developments to focus on its core server technology (see story, page 6).

In addition to nontraditional data types, Universal Server is expected to support on-line analytical processing queries through a new DataBlade module based on technology Informix acquired last year from Stanford Technology Group, Inc.

In addition, users will be able to develop custom DataBlades.

The Universal Server will be accessible from a host of client-side development tools, including Informix's own NewEra, Java and C++.

The integration work may be eased by the fact that Informix was already building its own extensible API to support nontraditional data types, sources said.

Informix customers using the company's database to manage Web content applauded the plan.

"Most of the data we're dealing with now is text, but we will eventually need to serve up more multimedia. Having Illustra [as part of the Informix engine] will be good for us," said Bill Rollinson, vice president of the Internet Shopping Network in Palo Alto, Calif.

*"Most of the data we're dealing with now is text, but we will eventually need to serve up more multimedia. Having Illustra [as part of the Informix engine] will be good for us," Rollinson said.*

While Universal Server is the focus of next month's roll out, the company is broadening its product line in several other areas.

After inking an agreement with middleware maker MobileWare Corp., Informix is gearing up to roll out Informix-Mobile this summer.

The tool will let users access Informix databases from laptops and other mobile systems. Informix will also bundle an API that links MobileWare with its NewEra development tool, company officials said.

On the tools front, Informix will delay shipping Version 3.0 of its NewEra application tool until the second quarter.

The software, a 32-bit application, was supposed to ship by the end of 1995.

"Shipping schedules were shifted in order to add multibyte character support to NewEra," said Geoffrey Roach, director of tools marketing at Informix.

☏ Informix: (415) 926-6300.

## IBM

*Continued from page 1*

the company to retain control of existing corporate backbones. Other vendors, particularly Cisco Systems, Inc., have targeted both areas.

"We are going to build the best suite of products to migrate SNA/APPN users to the switched world and demonstrate why they don't want to go to a router-based design first," said Rob Zimmer, program manager of ATM market development for IBM.

To get the ATM movement off the ground, IBM will pump up its existing ATM workgroup family by introducing less expensive, smaller 8260-type intelligent hubs, Zimmer said.

The hubs are designed to lower the cost of linking workgroup devices to ATM backbones. These hubs would be in the four- to six-port range, sources said.

At ComNet '96 next week, the company also will add to its low-end ATM family a 25M bit/sec workstation adapter and a new ATM workgroup switch, unofficially dubbed the 8285.

"ATM in the campus is only now starting, and we want to lower the price/performance level to help users get started," said Barbara Leonard, program manager for IBM ATM market planning.

### The APPN legacy

For legacy users, Zimmer said IBM wants to link its APPN/HPR and ATM MSS technologies to provide a low-cost, high-performance method of integrating switched and nonswitched networks.

Zimmer said by the third quarter of this year, IBM wants to combine the technologies on as many platforms as possible so users can begin running APPN over ATM.

Targeted products include 827X LAN switches, the Nways 3746 front-end processor, the 3172 Interconnect Controller and ATM desktops.

IBM first talked about combining ATM and HPR at the APPN Implementors Workshop last fall, but was not specific about where the technology would be used (*NW,* Aug. 28, 1995, page 6).

The melding of these technologies would enable APPN/HPR users to utilize APPN's class of service, transmission priorities and bandwidth control between pairs of workstations communicating across an ATM net. It also means users could migrate to ATM services by simply installing ATM MSS adapters in ATM access devices, such as switches, routers and workstations.

"Enabling users to deploy pieces of HPR around the enterprise makes sense in a strictly APPN/HPR environment, but IBM still hasn't made it clear how it will handle multiprotocol traffic in that environment," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

"It made a feeble attempt with the 2217 [which mixed SNA, APPN and other protocols in one box], but it's still an open issue," she said.

Others noted that while IBM has focused on bringing APPN users into the ATM fold, it still has not spelled out how traditional SNA traffic gets in. The mysterious Nways Model 200, which IBM has talked about for months but has not yet formally announced, is supposed to funnel multiprotocol and SNA data into an ATM backbone. But it likely will not be available until later this year, if then, analysts said.

For customers that deploy APPN/HPR and ATM, IBM wants to make the mainframe an integral part of that solution, so IBM's Enterprise Systems Connection technology will be enhanced to handle ATM and APPN/HPR traffic, according to Zimmer. The most significant advantage, he said, will be the improved performance. ■

**COMMENTS?**

*See "How to reach us" on page 6.*

## HP

*Continued from page 1*

analysts who have been briefed by HP.

The company has been fighting a religious war over 100M bit/sec technology since 1993, and as a result, HP's support of 100Base-T is seen as a victory for the fast Ethernet camp.

Nevertheless, HP intends to push forward its effort to standardize VG-AnyLAN technology at gigabit speeds (*NW,* Jan. 8, page 1).

Brice Clark, strategic planning manager at HP's Roseville Networks Division, confirmed that HP will offer 100Base-T technology and assured customers that the company's investment in 100VG-AnyLAN will continue.

**"HP will continue to strongly recommend 100VG-AnyLAN as the right choice for high-speed networks to the desktop but will also support 100Base-T to protect our customers' investment."**

*Brice Clark*

"We are supporting 100Base-T as a way of protecting our customers' investment, to allow them to integrate existing 100Base-T with 100VG-AnyLAN technology within a switched environment," he said.

Analysts said the move to support 100Base-T was long overdue. "HP has finally woken up," said Nick Lippis, principal at Strategic Networks Consulting, Inc., a consultancy in Rockland, Mass. "They seemed to be sleeping for a while, but now they have seen the light."

Todd Dagres, an analyst at Montgomery Securities, Inc., a financial firm in San Francisco, said HP eventually had to recognize that 100Base-T will be the market leader for 100M bit/sec technologies.

"HP has been delaying support of 100Base-T in an effort to garner support for its own 100VG-AnyLAN technology," Dagres said. "But enough of HP's customers want 100Base-T that they have to do it."

Skip MacAskill, senior research analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn., said HP's move was strictly business.

"This is a straight financial decision on HP's part to take advantage of a market opportunity," MacAskill said. "But I don't think it is in any way a reflection that they are giving up on 100VG-AnyLAN."

Reaction was mixed about what effect HP's move will have on users.

"This could be bad news for HP users who were forced into a 100VG-AnyLAN solution because it may signal that support and the life cycle of that technology may be greatly curtailed," said John Morency, principal with The Registry, Inc., a Newton, Mass.-based consultancy.

Morency added that HP's move to support 100Base-T demonstrates HP's lack of confidence in 100VG-AnyLAN to succeed as a market leader and may trigger other networking vendors to abandon 100VG-AnyLAN support.

"Vendors [that are supporting both 100Base-T and 100VG-AnyLAN] are probably going to dump 100VG-AnyLAN like a hot potato," Morency said. "So my freedom of choice as a user is going to be greatly diminished."

But Lippis disagreed. "This will give HP users more options," he said. "I don't think users need to worry that 100Base-T support will de-emphasize 100VG-AnyLAN from an investment and support perspective."

MacAskill also said HP's acceptance of 100Base-T spells good news for users that "won't have to have 100VG-AnyLAN crammed down their throats if they don't want it."

For customers that bought into 100VG-AnyLAN because they were beholden to HP and wanted to use 100Base-T technology, MacAskill said he expects HP to offer some type of swap-out program.

Kevin Walsh, network specialist at the University of California in San Diego, said he plans to continue using 100VG-AnyLAN hubs.

"I evaluated both [100VG-AnyLAN and 100Base-T] technologies and decided VG was better for our environment," Walsh said. "But I can certainly see the business case for HP supporting both options."

Part of the blame for the limited acceptance of 100VG-AnyLAN falls to IBM, which switched from early endorsements of the technology to pursue 25M bit/sec Asynchronous Transfer Mode desktop technology.

Once Big Blue abandoned the technology, the 100VG-AnyLAN camp eroded to the point that HP was the only vendor left, analysts said. "HP found themselves to be an army of one, and they couldn't fight alone," Morency said. ■

## HP offers wireless LAN device

Hewlett-Packard Co. next week will announce a wireless device that gives mobile users within an office a simple way to connect to the corporate LAN.

The NetBeamIR LAN access point is a desktop device that gives portable PCs network access via an infrared beam. A user can establish a connection by placing the portable PC within 3 feet of the wireless device, which connects directly to an Ethernet network at up to 4M bit/sec.

The access point uses the infrared networking capability of Windows 95 and supports connections to servers running NetWare, Windows NT, LAN Manager or IBM LAN Server. The device can be used with any portable PC equipped with an infrared port.

The NetBeamIR LAN access point is priced at $289 and will be available in April.

HP: (800) 533-1333.

*—Jodi Cohen*

**NetworkWorld**

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(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Nonqualified subscribers: $5.00 a copy; U.S. — $95 a year; Canada — $117.70 (including 7% GST, GST #126659952); Central & South America—$110 a year; Europe—$165 a year, all other countries—$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

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ISSN number: 0887-7661.

## Novell

*Continued from page 1*

zations designed to refocus it and make it more competitive with arch nemesis Microsoft Corp., Laube's main job was to convince customers and industry partners that Novell's vision of the future is clear.

### The Turning Point

The reorganizations, started at a September announcement referred to within Novell as the Turning Point, were an effort by Frankenberg to cut away parts of the company he considered extraneous to Novell's core networking business.

In the months since, Frankenberg has sold off the UnixWare division, put the WordPerfect business on the block, shed other groups and created partnerships with third parties to jointly develop products, including Unix and NetWare for SAA.

The refocus took Novell out of direct competition with Microsoft in the applications serving and desktop suite market while conserving resources to be spent developing NetWare and NetWare Directory Services (NDS).

Under Frankenberg's new plan, NDS running on NetWare, other operating systems and devices ranging from computers to home appliances, will be the glue that holds the Smart Global Network together.

Laube was reportedly a key contributor in a series of meetings last summer in which Frankenberg isolated Novell's executive staff in a hotel and hammered out a way Novell could compete successfully in the face of heavy competition from Microsoft.

Laube has globetrotted tirelessly, mostly with Christine Hughes, Novell's senior vice president of marketing, to sell the vision.

Frankenberg, meanwhile, reorganized the company several times, most recently putting all the products in a single group led by Steve Markman. That move may have thrown Laube's role into doubt.

While losing Laube is a blow to Novell, the initiatives he started will not die with his departure, said William Donahoo, director of product marketing for Novell's NetWare division.

Laube helped break down barriers between divisions and got them to cooperate more than they had in the past, Donahoo said. That and the development projects Laube initiated will not be undone by his leaving, he said.

**Toby Corey** *also left a top executive position at Novell.*

Laube begins his new job today at U.S. Web, a company founded by Toby Corey and Joe Firmage, who bailed out of their high-profile executive slots at Novell just months ago.

Novell officials declined to comment at midday Friday, except to say an official announcement of Laube's status would be forthcoming.

But Laube confirmed the report, saying he was eager to join the new venture. He declined to detail U.S. Web's plans.

"I always came from small businesses; that's where I started. A decade ago, I was a small businessperson. So I thought it was time to go again and build something from scratch in the Internet space. I'm looking forward to building something from nothing again," Laube said.

*On-line Editor Adam Gaffin contributed to this story.*

# Back to Reality

# PC rampage will restructure telecommunications service

Once upon a time, according to biblical legend, a youngster named David felled a 9 1/2-ft. warrior named Goliath with a slingshot and pebble. A lesson from that story is that small things can overpower the arrogance of a giant.

David J. Buerger

A modern version of David conquering Goliath is the personal computer. The widespread use of this lowly device toppled the power of companies peddling proprietary large systems and reordered the computer industry.

The wily PC is at it again. Its role as a communications tool is now wreaking havoc in the telecommunications industry.

Some early warning signals are the recently announced layoffs of tens of thousands of telecom workers, huge corporate restructurings, rumored mergers and endless wrangling over legislation to deregulate telecommunications. These painful events supposedly stem from the specter of looming competition between phone, cable and other companies. Forget that argument. Competition rises to fill unmet needs; and the need here is the ravenous data communications demands of the widely accepted PC.

It's hard to feel sorry for telephone service vendors. After all, they had plenty of time to react to the PC-based communications phenomenon. Their attention to data users was underwhelming.

Local Bells' first PC-oriented pitch in the mid-1980s was the central office-based LAN. It promised to provide PC-to-PC connectivity by switching data through the central office (CO) — and charge business users for each byte of data transferred. This greedy idea was dead on arrival.

More recently, local and long-distance vendors dragged their feet on providing widespread data services at good prices. Frame relay and switched multimegabit data services for PC LANs took a backseat to protecting cash cow leased-line business.

And then there was ISDN, first tariffed by Illinois Bell Telephone Co. in 1987. This wonder technology promised 64K bit/sec, then 128K bit/sec data transmission everywhere — much faster than standard PC modems.

Nearly a decade later, the Bells have snared a whopping 1% of 114 million access lines for ISDN service.

Truth is, phone companies hate ISDN. They wish ISDN for home PCs would go away — especially now that its popularity is rising. The reason: a small group of Web surfers are not using ISDN the way God (I mean, phone companies) intended. Supporting ISDN costs more than telco bean counters originally projected.

Here's the problem: ISDN basic-rate loops run about 18,000 feet from a CO. Links to people more than three miles from the CO require an expensive mid-span repeater. And guess what? That's where demand is rising. Pacific Bell, for instance, says 30% of new subscribers fall into that category, compared to 5% a year ago. That fact, coupled with many users who like to leave ISDN links nailed up like a leased line, have PacBell sobbing. It wants to cap free evening and weekend use, as well as double the usage fee to 2 cents per minute. That's double the rate for a measured business "plain-old telephone service" line; residential POTS customers pay no fee.

PacBell clearly wants to quit being an ISDN pioneer.

US WEST, which never pioneered anything, is so customer-oriented that it recently tried to triple its monthly ISDN service fee in Washington. The state utility commission denied the request. Even the Federal Communications Commission has guns pointing at PC Internet users. Chairman Reed Hundt is worried that the use of Internet phone applications will "rob" local phone companies of revenue because they bypass long-distance companies, which in turn won't pay mandated access fees to local phone companies. Hundt is considering a digital services surcharge to help finance universal telephone service.

For all the promise of PC-based communications, no one is happy. Phone companies claim they can't make money selling new digital services. And it's still hard for users to buy fast, cheap links. This problem is going to get worse. The trend of more home workers and more home-based Internet use means digital service usage will rise dramatically.

What idiot at the phone company wrote the strategic plan presuming limited-duration links? Home-based business users will need day-long links for videoconferences and server-based applications. Consumers will eat up daily hours of connect time pursuing entertainment and other needs.

Something has to give, and I don't see telephone companies stepping to the plate. The public network's design is skewed to concentrate equipment near large businesses. It's nowhere near ready to provide widespread broadband services to PC users in homes — and that's where the real growth will be.

The ultimate solution will be a reordering of the telecommunications service empire, thanks again to pressure from lowly Mr. PC. And thus, another giant will fall.

*Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.*

## ABEND

**abend** *(n)* **1:** abnormal end to a computer process **2:** the column that spares no expense to bring you the insights of Internet users and other high-tech wits

### Web sites you can't live without

Wherein the intrepid Abend surfers scour the Web for days on end in search of the ultimate Web sites but are foiled when the boss finds out what they're up to and demands they get back to work.

### The bar-code server

Great icebreaker at parties (Be sure to bring your laptop and wireless modem.) Typean 11-digit number and see what it would look like as a bar code.

*http://www.milk.com/barcode*

### Shakespearean Insult

**Take that, thou lumpish guts-griping fustilarian! A new insult, straight from the Bard, every time you reload the page.**

*http://www.nova.edu/Inter-Links/cgi-bin/bard.pl*

### The complaint-letter generator

Use this to generate complaint letters about, oh, people who hurl Shakespearean insults at you. You can generate between one and 10 paragraphs of invective at a time – and then use your browser's Mail command to send it off.

*http://www-csag.cs.uiuc.edu/individual/pakin/complaint*

### SSN server

For all those times you've forgotten where you were born. Type your social security number and it tells you what state it was issued in.

*http://www.smart.net/mcurtis-cgi-bin/ssn.html.*

### Light board

Turn your $5,000 workstation into a $30 Lite Brite simulator.

*http://asylum.cid.com/lb/lb.html*

### Dead people server

The intro sums it up: ``Remember whatshisname? He played the guy in that dumb movie with whosis. Whatever happened to him? Specifically, *is he dead yet?*"

*http://web.syr.edu/~rsholmes/dead/index.html*

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